PB86-224847

Superfund Record of Decision (ROD) Annual Report FY 1985

(U.S.) Environmental Protection Agency
Washington, DC

Jun 86

U.S. Department of Commerce
National Technical Information Service
NTIS

PB86-224847

ROD ANNUAL REPORT

FY '85

JUNE 1986

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

BIBLIOGRAPHIC INFORMATION

PB86-224847

Superfund Record of Decision (ROD) Annual Report FY ´85.

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PERFORMER: Environmental Protection Agency, Washington, DC.

The Record of Decision (ROD) process was very successful in FY´85. A total of 64 RODs, three Enforcement Decision Documents (EDDs) and one Negotiation Decision Document (NDD) were approved. The FY´85 RODs addressed a wide variety of technical problems including area-wide ground water contamination and compliance with other environmental laws.

KEYWORDS: *Ground water, *Water pollution.

Available from the National Technical Information Service, SPRINGFIELD, VA. 22161

PRICE CODE: PC A07/MF A01

THE ROD ANNUAL REPORT FOR FY'85

EXECUTIVE SUMMARY

The Record of Decision (ROD) process was very successful in FY'85. A total of 64 RODs, three Enforcement Decision Documents (EDDs) and one Negotiation Decision Document (NDD) were approved; 52 of the 64 first operable unit RODs targeted for the year were signed by September 30. This was also the first year that ROD approval authority was delegated to the Regional Administrators (RAs). Regionally approved RODs comprised 88.1% of all signed RODs, which exceeded the 60% target. Exhibit 1 shows the dramatic increase in RODs over the past few years.

The FY'85 RODs addressed a wide variety of technical problems including area-wide ground water contamination and compliance with other environmental laws. CERCLA compliance with the Resource Conservation and Recovery Act (RCRA) regulations continued to be an important issue. Two major RCRA breakthroughs, concerning CERCLA compliance, occurred during FY'85. The first involved consolidating contaminants that have migrated offsite. These contaminants can be consolidated onsite without the CERCLA program being considered a generator. The second concerned cleanup levels above background. This has been determined to be consistent with RCRA if the site-specific exposure analysis shows that remnant contamination above background levels would not be harmful to public health and the environment. Exhibit 2 provides a statistical analysis of key FY'85 ROD items concerning final remedies, capping and alternative technologies.

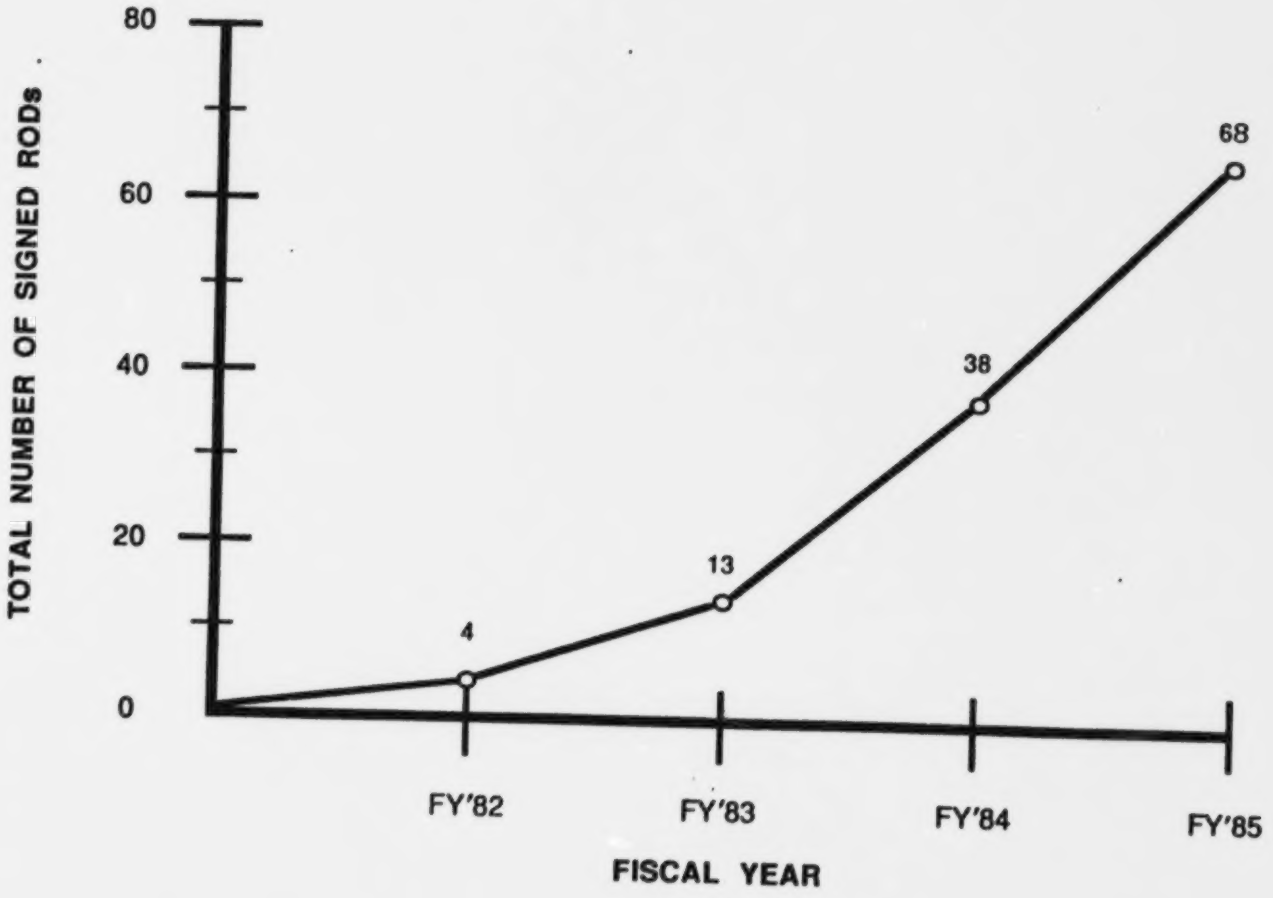
ROD information and data was widely distributed in FY'85. The first issue of the Superfund ROD Update was distributed at the ROD annual workshop in April. The Update was designed as a means to share information and identify Regional contacts for each ROD. In addition, full text RODs were made available to the public through the National Technical Information Service and the Environmental Law Institute.

As another means to ensure information and technology transfer, the ROD Annual Report has been designed to provide the Regions and Headquarters with summary data on FY'85 RODs. This report consists of the following sections:

- Executive Summary of the report highlighting FY'85 accomplishments.

EXHIBIT 1

NUMBER OF SIGNED RODs PER FISCAL YEAR *



* Includes Action Memos, Enforcement Decision Documents, and Negotiation Decision Documents

INDEX OF APPROVED REMEDIAL ACTIONS

REMEDY CATEGORIZATION AND ANALYSIS

The following analyses were generated from the Index of Approved Remedial Actions, which details the selected remedies for 66 approved FY '85 RODs/EDDs. The criteria used to define the analyses are indicated by the dot points below each category.

TOTAL NUMBER OF FY'85 SIGNED RODs/EDDs USED FOR THIS ANALYSIS - 66*

Title of Analysis	Number of Sites Meeting Criteria	% of Total
FY'85 RODs/EDDs addressing Ground Water	23	34.8%
• Any site whose remedy includes ground water treatment, either onsite or offsite • Any site whose remedy includes construction of air stripping or other facilities for treating contaminated ground water • Installation of ground water monitoring wells, or any form of pumping or monitoring without treatment was not included • Treatment of contaminated wells was not included		
FY'85 RODs/EDDs with Offsite Disposal	36	54.5%
• Any site whose remedy includes offsite disposal of wastes, including, but not limited to the following materials: soil, sludges, construction debris, contaminated ground or surface water, and tanks and drums		
FY'85 RODs/EDDs using Alternative Technologies	11	16.7%
• Any site whose remedy involves incineration, chemical stabilization, chemical neutralization, biological treatment, biological degradation, or soil flushing with chemically treated solutions		
FY'85 RODs/EDDs selecting the No-Action Alternative	3	4.5%
• Any site whose selected remedy is No-Action		

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* The Crystal Chemical, TX ROD was not included in this analysis. The ROD is an Enforcement Confidential Negotiation Decision Document (NDD), thus the remedy for this site has not been finalized. In addition, the Westinghouse Sites, IN EDD was not included in this analysis.

EXHIBIT 2 (CONTINUED)

Title of Analysis	Number of Sites Meeting Criteria	% of Total
FY'85 RODs/EDDs with Final Remedies • Any site with 'No further action' appearing in the "Media to be Addressed or Subsequent Remedial Actions" column of the Index	20	30.3%
FY'85 RODs/EDDs with Alternate Water Supplies • Any site whose remedy addresses the following: – Extending an existing water supply system – Installing a permanent alternate water supply system or "provision for" a permanent water supply system – Installation of new wells to supply public water needs – Replacement and/or relocation of existing water supply	10	15.2%
FY'85 RODs/EDDs with Onsite Landfilling • Any site whose remedy includes the specific construction of an onsite waste containment facility or disposal cell to contain wastes generated on- or offsite • Any site whose remedy involves construction of a cap or slurry wall, or onsite containment of waste without the specific construction of a containment cell was not included	4	6.1%
FY'85 RODs/EDDs with Temporary or Permanent Relocation of Residents • Any site whose remedy includes the temporary or permanent relocation of residents	1	1.5%
FY'85 RODs/EDDs with Capping • Any site whose remedy includes the construction of a synthetic, soil or clay cap • Any site whose remedy includes filling areas with clean soil, covering areas with clean soil, or grading and revegetating excavated areas was included	24	36.4%

EXHIBIT 2 (CONTINUED)

Title of Analysis	Number of Sites Meeting Criteria	% of Total
Future RODs/EDDs to address Ground Water	24	36.4%
• Sites where ground water appeared in the "Media to be Addressed or Subsequent Remedial Actions" column of the Index of Approved Remedial Actions		
Future RODs/EDDs to address Soil	11	16.7%
• Sites where soil appeared in the "Media to be Addressed or Subsequent Remedial Actions" column of the Index of Approved Remedial Actions • Any site addressing excavation of soil and/or sediments as a subsequent remedial action		

- ROD Summaries for each site describing site conditions and contaminants, performance standards, and institutional controls.

- Index of Approved Remedial Actions which summarizes all remedial actions approved to date, as well as any subsequent actions to be taken at a site.

- ROD Keyword List provides major key word categories and their subcategories for all RODs approved to date.

Information and data on approved remedial actions, contained in this report, will be very useful in preparing FY'86 RODs.

ROD SUMMARIES

APPROVED RECORDS OF DECISION (RODs)
FY 1985

TABLE OF CONTENTS

Region	Site/State	Page Number
I	Beacon Heights, CT	1
I	Cannon/Plymouth, MA	3
I	Charles George, MA (2nd Remedial Action)	5
I	Hocomonco Pond, MA	6
I	McKin Site, ME (2nd Remedial Action)	8
I	Nyanza Chemical, MA	9
I	Picillo Farm, RI	10
II	Bog Creek Farm, NJ	11
II	Bridgeport, NJ	12
II	D'Imperio Property, NJ	13
II	Friedman Property, NJ	14
II	GEMS Landfill, NJ	15
II	Goose Farm, NJ	16
II	Helen Kramer, NJ	17
II	Lipari Landfill, NJ (2nd Remedial Action)	18
II	Love Canal, NY	20
II	Olean Well Field, NY	21
II	Sinclair Refinery, NY	22
II	Swope Oil, NJ	24
II	Wide Beach, NY	25
III	Douglassville, PA	26
III	Harvey-Knott, DE	28
III	Heleva Landfill, PA	29
III	Lackawanna Refuse Site, PA	30
III	Lansdowne Radiation, PA	31
III	McAdoo Associates, PA (2nd Remedial Action)	32
III	Moyer Landfill, PA	33
III	Sand, Gravel & Stone, MD	35
III	Taylor Borough, PA	36
III	Tyson's Dump, PA	37
IV	American Creosote, FL	38
IV	Biscayne Aquifer Sites, FL	39
IV	Davie Landfill, FL	41
IV	Varsol Spill Site, FL	42
IV	Whitehouse Waste Oil Pits, FL	43

Region	Site/State	Page Number
V	A&F Materials Company, IL	44
V	Acme Solvents, IL	45
V	Byron/Johnson Salvage, IL	46
V	Cemetery Dump, MI	47
V	Charlevoix, MI (2nd Remedial Action)	48
V	Chem-Dyne, OH	49
V	Cross Brothers, IL (IRM)	50
V	Eau Claire, WI (IRM)	51
V	Kummer Landfill, MN	52
V	LeHillier/Mankato, MN	53
V	Main Street, IN	54
V	Morris Arsenic, MN	55
V	New Lyme, OH	56
V	Northernaire, MI	57
V	Old Mill, OH	58
V	Schmalz Dump, WI	59
V	Verona Well Field, MI (2nd Remedial Action)	60
V	Wauconda Sand & Gravel, IL	61
VI	Bayou Bonfouca, LA	62
VI	MOTCO, TX	63
VI	South Valley, NM (IRM)	64
VI	Triangle Chemical, TX	65
VII	Ellisville, MO	66
VIII	Milltown, MT (Supplemental ROD)	67
VIII	Woodbury Chemical, CO	68
IX	Celtor Chemical, CA (2nd Remedial Action)	69
IX	Del Norte, CA	70
IX	Jibboom Junkyard, CA	71
X	Ponders Corner, WA (2nd Remedial Action)	72
X	South Tacoma Channel-Well 12A, WA (2nd Remedial Action)	73
X	Western Processing, WA (2nd Remedial Action)	74

BEACON HEIGHTS, CT
September 23, 1985

ROD ABSTRACT

The Beacon Heights Landfill site is located two miles east of the intersection of Connecticut Routes 8 and 42 in Beacon Falls, Connecticut. From the 1920s until 1970 the site was known as "Betkoski's Dump" and consisted of approximately six acres on which active dumping occurred. According to records at the Connecticut Department of Environmental Protection (CT DEP), wastes accepted at the dump included municipal refuse, rubber, plastics, and industrial chemicals and sludges. Landfill operations consisted primarily of open burning along with the burial of noncombustibles. In 1970, the Betkoski property and adjacent properties totaling 83 acres were purchased by the Murtha Trucking Company, and the name was changed to Beacon Heights, Inc. Landfill. At this time, the landfill area was expanded to approximately 30 acres. Records of the CT DEP, including a 1973 report by the landfill engineer, listed rubber, plastics, oils, hydrocarbons, chemical liquids and sludges, and solvents as being disposed of at the landfill. Landfill operations reportedly ceased in 1979.

The selected remedial action for this site includes: excavation of Betkoski's Dump and other contaminated soils for consolidation on the main landfill prior to closure; RCRA capping of the consolidated wastes including gas venting and stormwater management controls; installation of a perimeter leachate collection system; collection of leachate and transportation to a licensed waste water treatment facility or onsite treatment followed by discharge to a tributary of Hockanum Brook; extension of a public water supply; fencing; installation of a more extensive ground water monitoring system; and enforcement of State and local institutional controls on ground water use in the impacted area. Total capital cost for the selected remedial alternative is estimated to be $17,397,000 with O&M costs approximately $235,000 per year. In addition, a Supplementary Decision Document will be prepared following design to justify the decisions reached on the manner and location of leachate treatment, the extent of excavation in the satellite areas, and the need for air pollution controls on the landfill gas vents.

PERFORMANCE STANDARDS OR GOALS: Wastes will be excavated to background or to alternate levels protective of human health, welfare, and the environment. Pre-design/design sampling will be necessary to define the excavation criteria.

INSTITUTIONAL CONTROLS: State and local institutional controls on ground water use will be enforced in the impacted area.

COMMENTS: 1) Consolidation -- Outlying Betkoski Dump wastes and contaminated soils and sludges around the site will be excavated, consolidated and placed on top of the landfill prior to closure. 2) ROD Addendum -- A ROD Addendum will be prepared following the design phase to justify the decisions reached on: the manner and location of leachate treatment (onsite or offsite); the exact extent and coverage of the RCRA cap on the landfill and the extent and depth of satellite areas to be excavated and consolidated on the main landfill; and the need for air pollution controls on the landfill gas vents.

KEYWORDS: Capping; Excavation; Ground Water; Ground Water Monitoring; Institutional Controls; Leachate Collection/Treatment; Soil; Surface Water; Venting; VOCs.

CANNON/PLYMOUTH, MA
September 30, 1985

ROD ABSTRACT

The Cannon Engineering Corporation (CEC) Plymouth Site is located in Cordage Park, a business and industrial park bordering Plymouth Harbor, in Plymouth, Massachusetts. The site consists of 2.5 acres which includes three above ground storage tanks, two of which are estimated to have nominal storage capacities in excess of 250,000 gallons each, and one which has an estimated 500,000 gallon capacity. The tanks were originally used for the storage of #6 marine fuel oil and bunker C oil. In 1976, CEC rented one tank for the reported storage of waste oil and later rented a second tank. Allegedly, CEC used the tanks to store hazardous wastes. In 1979, CEC was licensed by the Massachusetts Department of Environmental Quality Engineering (DEQE) to store motor oils, industrial oils and emulsions, solvents, laquers, organic chemicals, inorganic chemicals, cyanide and plating waste, clay and filter media containing chemicals, plating sludge, oily solids and pesticides. Potential problems observed at the site included slow leakage at the bottom seams of one of the tanks; adequacy of earthen dikes surrounding the tanks; odor complaints; and leaks from tank side valves. The principal contaminants of concern identified in the soil during the RI included polynuclear aromatic hydrocarbons (PAH), pesticides, and lead. Surface water samples collected from seeps along the tidal stream and shore contained iron, selenium, lead, manganese and silver. PAHs, lead, and pesticides were detected in sediment samples collected from the tidal stream. Low levels of pesticides and some metals were also detected in harbor sediments. Ground water samples did not exhibit analytical indications of organic chemical contamination however, low levels of some metals were detected.

It has been determined that selection of the cost-effective remedial alternative would best be served by generating supplemental information and deferring selection of the final remedial alternative. The ROD for CEC-Plymouth Site will be amended following evaluation of the new data. The ROD amendment will specify the remedial measures deemed appropriate to address contamination remaining at the site. The tasks necessary to generate supplemental information necessary for further remedial analysis are: removal and offsite disposal of tanks no. 1, 2, and 3 and associated piping; supplemental sampling of soil, ground water, surface water and sediments; and assessment of the floodplains. Total capital cost for this portion of the remedial decision is estimated to be between $350,000 and $433,000, with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: Excavation of contaminated material, if implemented, to a level protective of human health and the environment (RCRA).

INSTITUTIONAL CONTROLS: N/A

COMMENTS: ROD Addendum -- Selection of the cost-effective remedial alternative will best be served by generating supplemental information (additional sampling/analysis, floodplain assessment) and deferring selection of the final remedial alternative until the new information has been generated and evaluated. The ROD for the CEC-Plymouth Site will be amended, following the evaluation of the new data, to specify the remedial measures deemed appropriate to address contamination remaining at the site.

KEYWORDS: Deferred Decision; Ground Water; Heavy Metals; Offsite Disposal; Pesticides; Polynuclear Aromatic Hydrocarbons (PAH); Sediments; Soil; Surface Water.

CHARLES GEORGE, MA
(Second Remedial Action)
July 11, 1985

ROD ABSTRACT

The Charles George Land Reclamation Trust Landfill (CGLRT) site is a 69-acre landfill located in Tyngsborough, Massachusetts about 30 miles northwest of Boston and 4 miles south of Nashua, New Hampshire. From 1955 until 1971, the site was operated as a municipal dump. In 1973, CGLRT was issued a permit by the Massachusetts Division of Water Pollution Control to handle hazardous wastes in addition to municipal and domestic refuse. Disposal of hazardous wastes and substances, primarily in the form of drummed and bulk chemicals containing volatile organics and toxic metal sludges, continued from January 1973 to at least June 1976. The exact quantity of hazardous substances disposed at the site is unknown. Records submitted by the landfill operators and other available information show that at least 2,500 cubic yards of chemical waste material were landfilled.

The selected remedial action includes the installation of: a full synthetic membrane cap; a surface water diversion and collection system; a vent network with an off-gas collection system venting to the atmosphere; and a full peripheral leachate collection system. Total capital cost for the selected remedial alternative is estimated to be $13,613,725 and O&M costs are approximately $1,252,901 per year. A third remedial action addressing ground water contamination is expected following the completion of field studies.

PERFORMANCE STANDARDS OR GOALS: Mitigation of the offsite spread of contamination. Impacts to wetlands will be substantially minimized.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Acids; Air; Capping; Ground Water; Heavy Metals; Leachate Collection/Treatment; RCRA Part 264; Sludge; Surface Water; Surface Water Diversion/Collection; Toluene; Venting; VOCs; Wetlands.

HOCOMONCO POND, MA
September 30, 1985

ROD ABSTRACT

The Hocomonco Pond site consists of approximately 23 acres, located in the Town of Westborough, Worcester County, Massachusetts, and is bordered on the northwest by Hocomonco Pond. Research into the past activities at the Hocomonco Pond Site indicates that from 1928 to 1946, the site was used for a wood-treating operation by Montan Treating Company and American Lumber and Treating Company. This business consisted of saturating wood products (e.g., telephone poles, railroad ties, pilings and fence posts) with creosote to preserve them. During the operations, wastes were discharged into a pit lagoon (referred to as the "former lagoon"). The lagoon was excavated on the property to intercept and contain spillage and waste from the wood-treating operation. As this lagoon became filled with waste creosote, sludges, and water, its contents were pumped into two depressions, referred to as Kettle Pond, which is located east of the site, near the west side of Otis Street. In addition, site contamination extends into Hocomonco Pond and its discharge stream. The wood-treatment facility operated until the mid-1940s when it was converted into an asphalt mixing plant. Discarded aggregate and asphalt are common throughout the site. The last use of the site was as a cement plant from which dry cement was distributed in bulk.

The selected remedial alternative for this site includes: grading and capping of the former lagoon and relocation of the storm-water drain pipe currently located adjacent to the east side of the former lagoon; for the Kettle Pond area, dewatering the pond and lowering the ground water level in the immediate area, soil/waste excavation based primarily on visible contamination criteria, with additional removal of soils based on sampling and analysis of soil quality and leaching properties. Additional excavation will be done to remove contamination to the extent necessary to ensure mitigation of ground water contamination. This remedial alternative also includes: dewatering of sediments with disposal in an onsite landfill; mechanical dredging and onsite disposal of contaminated sediments for the Hocomonco Pond and discharge stream; sealing the storm drain for Otis Street; removal and onsite disposal of contaminated materials at three isolated areas of contamination (soil near Monitoring Well-1, tank bases adjacent to former lagoon, and drain channel sediments at the southwest side of Hocomonco Pond); and air and water quality monitoring and post closure activities consistent with RCRA regulations. Total capital cost for the selected remedial alternative is $2,213,000 with O&M costs approximately $56,000 per year.

PERFORMANCE STANDARDS OR GOALS: The extent of soil/waste removal in the Kettle Pond area will be based primarily on visible contamination criteria but will include additional removal of contaminants based on sampling and analysis of soil conducted during excavation to ensure that contaminated soils are excavated to the extent necessary to ensure mitigation of ground water contamination. The extent of excavation beyond the visible contamination criteria is expected to be approximately two to three feet. The cleanup level for ground water and the duration of the pump and treatment phase at the Kettle Pond area will be determined for the site conditions existing after soil/waste removal. Final ground water cleanup levels will be set based upon background levels, Maximum Contaminant Levels (MCLs) or a demonstration of Alternate Concentration Limits (ACLs) according to 40 C.F.R. Part 264. The action levels for air contamination at the site boundary may be those proposed by the Centers for Disease Control, 2 ppm total concentration of volatile organic compounds in the air at the site boundary.

INSTITUTIONAL CONTROLS: The area of the site cap, in the former lagoon area and onsite landfill for Kettle Pond sediments, will not be available for future development, and deed restrictions are required. In addition, deed restrictions are required for the embankment area at the east side of Otis Street.

COMMENTS: 1) Consolidation -- Materials from Kettle Pond, Hocomonco Pond and discharge stream, and isolated areas will be disposed of onsite. Materials will be disposed on top of the former lagoon, in the onsite RCRA landfill constructed for the Kettle Pond soil/waste, or a combination of both will be used depending on final design considerations related to the facility's capacity and on the topography of the cap.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Chromium; Dredging; Excavation; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; Onsite Disposal; Organics; Phenols; Sediments; Sludge; Soil; Surface Water; Wetlands.

MCKIN, ME
(Second Remedial Action)
July 22, 1985

ROD ABSTRACT

The McKin Company site is located on the west side of Mayall Road between Route 115 and Pownall Road in Gray, Maine. The site is approximately seven acres with 4.5 acres cleared and partially excavated. Between 1965 and 1978, the McKin Company operated a waste collection, transfer, and disposal facility at the site. The Remedial Action Master Plan (RAMP) for the McKin site was prepared in April 1983. Initial Remedial Measures (IRMs) implemented at the site included cleaning and removal of all remaining above-ground tanks. This work was completed in September 1985 and represents the most recent removal action to take place at the site. Presently, the site consists of a fenced enclosure containing an incinerator, a concrete block building, an asphalt-lined lagoon, miscellaneous debris, and one buried fuel tank. An outer fence along Mayall Road and portions of the northern and southern site boundaries restrict vehicle and pedestrian access to the site.

The selected remedial action includes: onsite soil aeration; offsite disposal of approximately 16 drums; soil tests; a ground water extraction, treatment, and surface water discharge system; an offsite ground water and surface water monitoring program to evaluate the effectiveness of the onsite source control and offsite ground water extraction and treatment system; and removal and site closure activities. Total capital cost for the selected remedial alternative is estimated to be $3,919,000 with O&M costs of approximately $38,900 per year.

PERFORMANCE STANDARDS OR GOALS: Target ground water quality performance standards of 92 ppb 1,1,1-trichloroethane and 28 ppb trichloroethylene. Target soil performance standards of 0.1 ppm trichloroethylene averaged over a treatment volume and for heavy metal soil contaminants, the levels established in the Extraction Procedure (EP) toxicity tests (40 CFR Part 261.24) or the results of solute fate and transport modeling. Trichloroethylene performance standards are based on a cancer risk of 10^{-5}.

INSTITUTIONAL CONTROLS: EPA is not confident that long-term institutional restrictions could be implemented and enforced on the affected land to ensure that contaminated ground water is not utilized.

COMMENTS: ROD Addendums -- A pilot soil aeration study will be performed during remedial design to determine if soil aeration of the contaminated areas can be performed in a manner protective of public health and the environment. If it cannot, a ROD Addendum will be prepared to select another source control remedy. In addition, a reevaluation of performance standards for offsite ground water contamination levels or onsite soil contamination levels may be necessary.

KEYWORDS: Aeration; Ground Water; Ground Water Monitoring; Ground Water Treatment; Offsite Disposal; Oils; Soil; Surface Water; Trichloroethylene (TCE); VOCs.

NYANZA CHEMICAL, MA
September 4, 1985

ROD ABSTRACT

The Nyanza Chemical Waste Dump site occupies 35 acres on the north and south sides of Megunco Road in the Village of Ashland in Middlesex County, MA, approximately 35 miles west of Boston. The Nyanza site was occupied from 1917 to 1978 by a succession of companies involved in the production of textile dyes and intermediates. Large volumes of industrial waste water generated by these companies, containing high levels of acids and numerous organic and inorganic chemicals, including mercury, were partially treated and discharged into the Sudbury River via a small unnamed stream (referred to as Chemical Brook). Large volumes of chemical sludges generated by the waste water treatment processes along with spent solvents, off specification products, and other chemical wastes were buried onsite. The area that contains the largest amount of buried waste and exposed sludge is referred to as the "Hill" section.

The selected remedial action for this site includes: excavation of all outlying sludge deposits and contaminated soils and sediments associated with these deposits to background levels; consolidation of this material with the Hill sludge deposits; capping of the Hill area in conformance with the technical requirements of RCRA; construction of a ground water and surface water diversion system on the upgradient side of the Hill; backfilling the excavated areas to original grade and revegetating the wetland areas; and construction of a more extensive ground water monitoring network to enable future evaluation of the effectiveness of the cap. Total capital cost for the selected remedial alternative is estimated to range from \$5.6 to \$9.8 million, with annual O&M costs of \$92,000 for year 1 and \$70,000 for years 2-30. EPA will undertake an additional RI/FS to evaluate the extent of and risks posed by offsite ground water contaminant migration and sediment contamination in the Sudbury River and wetlands contiguous to the site. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared.

PERFORMANCE STANDARDS OR GOALS: Excavation of all outlying sludge deposits and contaminated soils and sediments associated with these deposits to background levels for chromium, lead and mercury.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Consolidation -- All outlying sludge deposits and contaminated soils and sediments associated with these deposits will be consolidated with the Hill sludge deposit onsite, prior to capping.

KEYWORDS: Acids; Arsenic; Capping; Chromium; Excavation; Ground Water; Ground Water Diversion; Ground Water Monitoring; Heavy Metals; Inorganics; Organics; Sediments; Sludge; Soil; Surface Water; Surface Water Diversion/Collection; Wetlands.

PICILLO FARM, RI
September 30, 1985

ROD ABSTRACT

The Picillo Farm site is located in Coventry, Rhode Island, approximately 20 miles southwest of Providence. Drums containing hazardous and bulk wastes were illegally disposed within an 8-acre area of the Picillo Farm in 1977. A series of trenches--the northwest trench, northeast trench, west trench, south trench, and two slit trenches--were used for this activity. In September 1977, an explosion and fire at the site brought the dumping activities to the attention of regulatory agencies. Since that time, a number of investigations and remedial activities have been conducted at the site. PCBs, organics, and phenols were identified in onsite soils.

The selected remedial action for this site includes: disposal of approximately 3,500 cubic yards of primarily PCB contaminated soils and disposal of approximately 3,000 cubic yards of primarily phenol contaminated soils onsite in a RCRA/TSCA landfill; and implementation of site closure activities. Total capital cost for the selected remedial alternative is estimated to be $841,600 with O&M costs approximately $12,120 for the first year, $25,648 for years 2-4 and $19,048 for years 5-30 (with the exception of year 16 at $34,048).

PERFORMANCE STANDARDS OR GOALS: Not specified.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: RCRA/TSCA Onsite Landfill--Based on the selected remedy contaminated soil would be disposed of in an onsite landfill consisting of an impermeable double bottom liner with a leachate collection and leak detection system that would protect against contaminant migration. Due to high ground water, the State is exploring other remedies.

KEYWORDS: Excavation; Ground Water; Ground Water Monitoring; Inorganics; Leachate Collection/Treatment; Onsite Disposal; Organics; PCBs; Phenols; RCRA Landfill Specifications; RCRA Onsite Disposal Requirements; Risk Level; Tetrachloroethylene (PCE); TSCA Onsite Disposal Requirements; VOCs.

BOG CREEK FARM, NJ
September 30, 1985

ROD ABSTRACT

The twelve-acre Bog Creek Farm is located in Howell Township, Monmouth County, New Jersey. The site consists of a four-acre disposal area, a man-made pond and a dike. Bog Creek Farm was purchased in June 1973 by Western Ranch Corporation, an entity owned by Fred and Margaret Barry. It is alleged that in 1973 and 1974 the Barry's dumped wastes at Bog Creek Farm generated from a paint manufacturing operation that they owned. These wastes, reportedly bulk liquids and sludges, were dumped on the ground and in a trench. Samples of the wastes taken during the RI confirmed the presence of a wide variety of organic compounds and heavy metals. Total Volatile Organic (TVO) concentrations in the soil were found as high as 44,000 ppm. The pond and a bog which lies just east of the site are particularly contaminated with TVO concentrations as high as 20 ppm and 494 ppm, respectively.

The cost-effective remedial actions selected for this site include: removing the waste water and sediments from the pond and bog; regrading and covering the pond and bog to prevent reponding; treating the waste water onsite and discharging to the nearby stream; excavating the waste deposits and contaminated soil 10,000 ppm TVOs; incinerating excavated materials at a temporary facility onsite or at an offsite facility in accordance with RCRA; conducting a further analysis of the impact of the residual contaminated soil to determine the extent of additional site remediation necessary; evaluating soil washing, segregation and other innovative technologies for the residual contaminated soil; covering the excavated area with a compacted soil cap; constructing a security fence surrounding the site and work areas; and implementing a monitoring program to assess the effectiveness and reliability of the remedial action. The estimated capital cost for the selected remedial alternative is $9.2 million and O&M costs are approximately $54,400 annually.

PERFORMANCE STANDARDS OR GOALS: Excavation of the source material in the soil 10,000 ppm TVOs as the first operable unit. This concentration targets the original source of liquid in addition to solid waste.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: N/A

KEYWORDS: ACL; Alternative Technology; Capping; Excavation; Ground Water; Heavy Metals; Incineration; Inorganics; Organics; Remnant Contamination; Soil; Toluene; Wetlands.

BRIDGEPORT, NJ
December 31, 1984

ROD ABSTRACT

This 30-acre site is located approximately one mile east of the Town of Bridgeport and two miles south of the Delaware River. The site is an abandoned waste oil storage and recovery facility which operated from 1950 through the early 1970s. The site includes a tank farm consisting of over 90 tanks and process vessels, drums, tank trucks and a 12.7-acre waste oil and waste water lagoon. The lagoon is divided into three layers: an oily upper layer, an aqueous middle layer, and bottom sludge/sediment deposits. Sampling of these lagoon layers revealed average PCB concentrations in excess of 500 ppm. Sampling of the ground water revealed organics, such as benzene, methylene chloride and toluene, at concentrations up to 1,000 ppb and acetone at levels up to 70 ppm.

The cost-effective remedial alternatives selected for the first operable unit for the lagoon include: disposal of oily waste and sediment/sludge via onsite incineration; removal and disposal of contaminated water via onsite treatment system; drum excavation and removal; and maintenance pumping to prevent further migration of the contaminated plume. For the tank farm the first operable unit includes: complete removal of tanks and waste; installation of a water supply pipeline from an existing pump station; and a second phase RI/FS to determine appropriate ground water cleanup and lagoon closure remedies. The estimated total project capital cost for this remedy is $57,672,000 and the estimated present worth 30-year operation and maintenance costs for the waste supply pipeline is $20,000.

PERFORMANCE STANDARDS OR GOALS: Contaminated sludge will be excavated until dredge spoils contain soils which do not appear to be visibly contaminated. "Visible contamination" is defined as the oily characteristics of the sludge. Once non-oily sludge or soil is observed, the initial excavation will stop. Treatment and disposal of contaminated water must meet a TOC limit of 50 ppm on a 30-day average as well as other limitations specified by the State to protect the water quality of the receiving stream.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: N/A

KEYWORDS: Alternative Technology; Alternate Water Supply; Competitive Bidding; Excavation; Ground Water; Incineration; Oil; Organics; PCBs; Sludge; Soil; State Criteria; Toluene; Wetlands.

D'IMPERIO PROPERTY, NJ
March 27, 1985

ROD ABSTRACT

The D'Imperio Property site is an inactive waste disposal dump located in a semi-rural region of Atlantic County within the New Jersey Pinelands Reserve. The site is relatively flat with slopes ranging from one to three percent. Two wetlands are located to the north and south of the site, approximately 2,000 and 4,000 feet away, respectively. The site lies in a cleared area with wastes deposited randomly on the surface and some wastes partially buried. The exact period of disposal activities at the D'Imperio site is unknown. However, it is believed that unauthorized dumping took place from the late 1960s to 1976. The results of the RI indicate that wastes disposed of at the site resulted in the contamination of the underlying ground water. In addition, the soil adjacent to and underlying the disposal area is also contaminated. Critical contaminants identified onsite include benzene, methyl ethyl ketone (MEK), 1,2-dichloroethane, ethylbenzene, tetrachloroethylene, toluene, trichloroethylene, xylene, arsenic, chromium and lead.

The selected remedial alternative for the D'Imperio site includes excavation and transportation of 3900 cubic yards of contaminated waste and soil and surface drums to a RCRA-regulated disposal site; construction of a RCRA cap following completion of the excavation; and pumping and treating contaminated ground water from two affected aquifers prior to reinjection or surface discharge. The treatment process is estimated to take 17 months and will provide for the removal of both organic and inorganic contaminants. After 17 months an evaluation will be made to determine the effectiveness of the cleanup program as well as the need to continue pumping and treating the contaminated ground water. The estimated capital cost of the selected remedial alternative is $4,251,551, with operations and maintenance costs estimated to be $1,169,449 for the life of the project.

PERFORMANCE STANDARDS OR GOALS: Remove 3,900 cy of waste materials and highly contaminated soils; construct a cap in accordance with RCRA; pump and treat three pore volumes; and monitor and compare to appropriate drinking water standards with follow-up evaluation to assess the need for additional pumping and treatment versus establishing an alternate concentration limit.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: N/A

KEYWORDS: ACL; Arsenic; Capping; Chromium; Excavation; Ground Water; Ground Water Treatment; Heavy Metals; Inorganics; O&M; Organics; Soil; State Criteria; State Permit; Toluene; Trichloroethylene (TCE).

FRIEDMAN PROPERTY, NJ
April 30, 1985

ROD ABSTRACT

The Friedman Property site is located in Upper Freehold Township, Monmouth County, New Jersey and is an open, vacant lot with scrub vegetation. The site is bordered by an unnamed tributary to Lahaway Creek, a single-family residential property, and Routes 537 and 539. Between the late 1950s and the early 1970s the site received bulk liquids and household and demolition debris.

The selected remedy for the Friedman Property site consists of no action with regard to remediating the low levels of contamination detected at the site, monitoring onsite wells annually for a five-year period, and recommending that the State of New Jersey request the appropriate local authorities to implement deed restrictions on the property. Annual O&M costs for well monitoring are estimated to be $12,000.

PERFORMANCE STANDARDS OR GOALS: N/A

INSTITUTIONAL CONTROLS: Deed restrictions for onsite excavation and agricultural and residential use.

COMMENTS: N/A

KEYWORDS: Ground Water Monitoring; Inorganics; No Action Alternative; Organics; Phenols.

GLOUCESTER ENVIRONMENTAL MANAGEMENT
SERVICES (GEMS) LANDFILL, NJ
September 27, 1985

ROD ABSTRACT

The 60-acre GEMS Landfill site is located in Gloucester Township, New Jersey. Gloucester Township has owned the GEMS from the late 1950s up to the present. During this time period the GEMS Landfill has been operated by various parties as a disposal site for solid, liquid and hazardous wastes and substances. Records indicate that a variety of industrial wastes including asbestos, solvents and other materials were disposed of at the GEMS site between 1970 and 1979. In 1980, sludge from the City of Philadelphia northeast waste water treatment facility was disposed of at GEMS. Analyses of the sludge revealed the presence of dichlorodiphenyl dichloroethane (DDD). The results of the RI show that ground water, surface water (Holly Run) and soil are severely contaminated with organic and inorganic hazardous substances. Also, volatile organic compounds are volatilizing into the atmosphere and significantly degrading air quality.

The cost-effective remedial actions selected for this site include: construction of a landfill cap with regrading of existing landfill side slopes, an active gas collection and treatment system, a ground water pumping and treatment system (treatment preference is pretreatment and discharge to the POTW), surface water controls, and a security fence; and implementation of a monitoring program. The State's proposed remedial action includes construction of a ground water/leachate collection and pretreatment system (in the Holly Run area only), relocation of Holly Run, connecting ten residences to an existing water main, and implementation of limited runoff controls as an initial phase of the selected remedy. The estimated capital cost for the selected remedial actions is $27,365,000 and annual O&M costs are approximately $601,000.

PERFORMANCE STANDARDS OR GOALS: Construct a cap in accordance with RCRA except there will be no synthetic liner due to steep slopes. Discharge criteria have not yet been established for the ground water leachate and landfill gas treatment. Discharge criteria will be established by the State under existing regulations and are dependent on the point of discharge which will be determined in the early stages of the remedial design.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air; Capping; Ground Water; Ground Water Treatment; Inorganics; Leachate Collection/Treatment; Organics; Publicly Owned Treatment Works (POTW); Soil; Surface Water; Venting.

GOOSE FARM, NJ
September 27, 1985

ROD ABSTRACT

The Goose Farm site is located approximately two miles northeast of the Town of New Egypt in Plumsted Township, Ocean County, New Jersey. The Goose Farm was used as a hazardous waste disposal site from the mid 1940s to the mid 1970s by a manufacturer of polysulfide rubber and solid rocket fuel propellant. The majority of manufacturing wastes, lab packs, 55 gallon drums, and bulk liquids were dumped into a pit dug through the fine sand. Investigations have found contaminated soils containing volatile, acid and base/neutral organic pollutants throughout the disposal area. In addition, sampling shows contamination of ground water up to 570 ppm total priority pollutants and contamination of the surface water up to 1100 ppb total volatile organics.

The recommended remedial alternative for this site is expected to be implemented in a phased manner. First, the contaminated soil and ground water underlying the site will be flushed. The ground water will be recovered using a well-point system and will be treated onsite prior to reinjection into the soil. Following soil flushing and ground water recovery and treatment, extensive testing will be conducted to determine the need to cap the site. In addition, during and after soil flushing and ground water recovery and treatment activities, extensive testing will be conducted to determine the extent of PCB contamination in the former drum pit area. Test data will determine the need to remediate PCB-contaminated soil. If such remediation is deemed necessary, a supplementary Record of Decision will be prepared. Total capital cost for the selected remedial alternative is estimated to be $3,014,000.

PERFORMANCE STANDARDS OR GOALS: The proposed ground water treatment system will be designed to meet the effluent limits established in the NJPDES permit.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: Soil Contamination Evaluation Methodology (SOCEM) -- If a steady state of contamination removal is achieved, the SOCEM model or a similar model will be used to evaluate whether alternative concentration limits are appropriate.

KEYWORDS: ACL; Alternative Technology; Capping; Ground Water; Ground Water Treatment; Organics; PCBs; Phenols; State Criteria; State Permit; Soil; Trichloroethylene (TCE).

HELEN KRAMER LANDFILL, NJ
September 27, 1985

ROD ABSTRACT

The Helen Kramer Landfill is located in Mantua Township, Gloucester County, New Jersey. The site encompasses a 66-acre refuse area and an 11-acre stressed area between the refuse and Edwards Run which is located immediately east of the landfill. The Helen Kramer Landfill site was originally operated as a sand and gravel pit. The site became an operating landfill between 1963 and 1965, during which time landfilling occurred simultaneously with sand excavation. Very little is known about the landfill activities between 1965 and 1970. From 1970 to 1981 it was alleged by area residents that sporadic chemical dumping occurred. The New Jersey Department of Environmental Protection files and other reports indicate that materials containing hazardous substances were disposed of at the landfill during this period. Sampling conducted during the RI showed that the underlying aquifer is heavily contaminated with organic compounds including trichloroethanes, benzene, toluene, and phenols. Inorganic chemicals found in the ground water include arsenic, lead, chromium, nickel, and iron. The aquifer is discharging into Edwards Run which is also heavily contaminated with similar organics and inorganics.

The cost-effective remedial actions selected for this site include: construction of a ground water leachate collection trench, a clay cap, upgradient slurry wall, active gas collection and treatment system, and a security fence; dewatering, excavation, and filling of the leachate ponds and lagoons; implementation of surface water controls; a monitoring program; and collection and treatment of ground water/leachate from the trench (treatment preference is pretreatment and discharge to the publicly owned treatment works (POTW)). The estimated capital cost for this remedy with pretreatment of the ground water/leachate is $36,478,000 and with complete onsite treatment is $38,089,000. O&M costs vary over the 30-year life of the remedy. First year O&M costs are projected to be $1,047,900 for pretreatment and $792,100 for complete onsite treatment.

PERFORMANCE STANDARDS OR GOALS: Construct a cap in accordance with RCRA except there will be no synthetic liner due to steep slopes. Treatment discharge criteria will be established by the State and/or local POTW under existing regulations.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air; Arsenic; Capping; Excavation; Floodplain; Ground Water; Ground Water Treatment; Inorganics; Leachate Collection/Treatment; Organics; Phenols; Publicly Owned Treatment Works (POTW); Slurry Wall; Soil; Surface Water; Toluene; Venting; Wetlands.

LIPARI LANDFILL, NJ
(Second Remedial Action)
September 30, 1985

ROD ABSTRACT

The Lipari Landfill site is located in Mantua Township, Gloucester County, New Jersey and is adjacent to the towns of Pitman and Glassboro. The site is approximately fifteen acres in size; six acres of which were used for hazardous waste landfilling activities. Trenches excavated for sand and gravel were backfilled with municipal refuse, household wastes, liquid and semi-solid chemical wastes, and other industrial wastes. Although no detailed records were kept, it has been estimated that 12,000 cubic yards of solid wastes and 2.9 million gallons of liquid wastes were disposed of at the site. Wastes reported to have been disposed of include solvents, paint thinners, formaldehyde paints, phenol and amine wastes, dust-collector residues, resins and ester press cakes. Initial removal and remedial actions completed at the site include: fencing the entire fifteen acres and the adjacent marsh area, installing a bentonite/soil slurry wall keyed into the underlying aquitard, covering the site with an impermeable synthetic membrane liner, and installing a passive gas-venting system (see the ROD dated 8/13/82 for additional information).

The cost-effective remedial actions selected for this site include: installation of ground water/leachate and injection wells within the containment system to dewater and flush the system; pumping and treating the ground water/leachate from within the containment system (treatment preference of the collected leachate is onsite pretreatment and discharge to the publicly owned treatment works (POTW)); installation and monitoring of ground water wells downgradient of the site; flushing the containment system to cleanse the encapsulated material of water-borne contaminants; and continued pumping and treating of the ground water should applicable standards not be met once flushing is terminated. Identification of remedial action alternatives to mitigate potentially contaminated offsite areas will be made in the near future. The estimated capital cost for this project is $3,464,000 and annual O&M costs are estimated to be $715,000. These cost estimates will be affected by the offsite/onsite treatment systems ultimately designed.

PERFORMANCE STANDARDS OR GOALS: Comprehensive evaluation within five years of source control and offsite remediation. Source control evaluation will consider marginal benefits from successive flushing cycles along with the potential effect of the release of leachate into the ground water.

INSTITUTIONAL CONTROLS: Not Specified.

COMMENTS: 1) Offsite Policy -- The benefits of cleansing the containment system of water-soluble contaminants justifies the additional cost relative to enhanced containment. 2) Remedy Selection -- Discharging pretreated leachate to the POTW is dependent on approval by the State and the POTW. If such approval is not provided, the leachate may be treated onsite and discharged to nearby surface water or transported offsite for treatment at a permitted hazardous waste facility.

LIPARI LANDFILL, NJ
(Continued)

KEYWORDS: Arsenic; Chromium; Containment; Deferred Decision; Ground-Water; Ground Water Treatment; Heavy Metals; Leachate Collection/ Treatment; Organics; Phenols; Publicly Owned Treatment Works (POTW); SNARL; Soil; Toluene; Water Quality Criteria.

LOVE CANAL, NY
May 6, 1985

ROD ABSTRACT

The Love Canal site is located in the southeast corner of the City of Niagara Falls and is approximately one-quarter mile north of the Niagara River. Between 1942 and 1952, Hooker Chemical and Plastics Corporation (now Occidental Chemical Corporation) disposed of over 21,000 tons of various chemicals into Love Canal. The solid and liquid wastes deposited into the canal include acids, chlorides, mercaptans, phenols, toluenes, pesticides, chlorophenols, chlorobenzenes, and sulfides. The results of the site investigation conducted by Malcolm Pirnie provided evidence that the site is contaminated with benzene and its derivatives, toluene, trichlorobenzene, arsenic, zinc and dioxin (2,3,7,8 TCDD).

The selected remedial action includes hydraulic cleaning of designated sewers, removal and disposal of contaminated sediments followed by television inspection; repair of the damaged flood gate at the 102nd outfall storm sewer; limiting access, dredging designated portions of the creeks and hydraulically cleaning Black Creek culverts; erection of a berm at the 102nd Street outfall area which will control sediment migration until issues concerning the source of contamination from the 102nd Street Landfill are resolved. All waste will be stored onsite in an interim storage facility. In addition to the above remedial action, a permanent administration building will be constructed on the site. Total capital cost for the selected remedial alternative is estimated to be $8,929,000. (Since the ROD was approved, cost estimates for the sewer and creek cleanup have increased. Total capital cost for the selected remedial alternative is now estimated at $12,000,000.)

PERFORMANCE STANDARDS OR GOALS: The Centers for Disease Control has recommended that residential soils should not contain TCDD at average concentrations exceeding 1 ppb.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air; Arsenic; Dioxin; Direct Contact; Excavation; Inorganics; Onsite Disposal; Organics; Phenols; Public Exposure; Risk Assessment; Sediments; Soil; Surface Water; Toluene.

OLEAN WELL FIELD, NY
September 24, 1985

ROD ABSTRACT

The Olean Well Field is located in the eastern portion of the City of Olean, and also encompasses part of the Town of Olean, in Cattaraugus County, New York. Early in 1981, the three municipal wells (Well numbers: 18M, 37M and 38M) at the site were found to contain levels of trichloroethylene (TCE) at concentrations above the New York State Department of Health (NYSDOH) Drinking Water Guidelines (50 ppb). These wells were closed and an old surface water filtration plant was reactivated to provide water to city residents. Private wells in the area were subsequently tested and many were found to be contaminated. Approximately one half of the contaminated private wells have shown TCE levels over 1,000 ppb. The highest level of TCE recently detected in a private well was 3,100 ppb (sample taken June 1985). Significant concentrations of several volatile organics, (e.g., trans-1,2-Dichloroethylene, 1,1,1-trichloroethane and 1,1-Dichloroethane) were also observed in the soil and ground water upgradient from the municipal wells.

The selected remedial action for this site includes: reactivating the municipal wells and constructing a packed tower air stripping system north of the Allegheny River at municipal well 18M to treat the ground water to a maximum contaminant level (MCL) of 5 ppb for TCE; construction of a similar air stripping system south of the river to treat water from wells 37M and 38M; discharging all treated water into the public water supply system; extending the City of Olean water lines into the Town of Olean and hooking up 93 private well users to the public water supply system; inspecting the McGraw-Edison industrial sewer and analyzing repair and replacement options; recommending institutional controls restricting the withdrawal of ground water for drinking purposes where MCLs are exceeded; and initiating a supplemental Remedial Investigation and Feasibility Study to evaluate source control measures. The air stripping systems will also treat the other volatile organics found in the ground water to a 10^{-6} risk level. Total capital cost for the selected remedial alternative is estimated to be $1,996,780. O&M costs total approximately $799,040 per year and include the City of Olean's regular well maintenance costs of $611,500.

PERFORMANCE STANDARDS OR GOALS: Treating ground water to 5 ppb for TCE.

INSTITUTIONAL CONTROLS: The ROD recommended establishing institutional controls to prohibit withdrawal of ground water from portions of the aquifer which exceed 5 ppb TCE.

COMMENTS: N/A

KEYWORDS: Air Stripping; Alternate Water Supply; Ground Water; Ground Water Treatment; Institutional Controls; Organics; Trichloroethylene (TCE).

SINCLAIR REFINERY, NY
September 30, 1985

ROD ABSTRACT

The former 103-acre Sinclair Oil Refinery is located in the Town of Wellsville, Allegany County, New York. The site was originally developed as an oil refinery during the late 1800s and was operated by the Wellsville Refining Company. Products manufactured at the site included lubricating oils and grease, fuel oil, naptha, gasoline, lighter fluid and paraffin. In 1924, the Wellsville Refining Company sold the property and plant to Sinclair Refining Company which maintained and operated the refinery until 1958, when operations ceased as a result of a fire. While the refinery was in operation, the southernmost portion of the property was used as a landfill to dispose of approximately 230,000 yd^3 of wastes. Substances deposited in the landfill consisted of drummed waste, oily and tarry sludges, and hazardous waste compounds in other forms. The landfill consists of the "Central Elevated Landfill Area" (CELA), a 9.2-acre landfilled area to the north, the "South Landfill Area" (SLA) to the south, and a 1-acre sand and gravel borrow area between the two landfilled areas. This 12.5-acre landfill sub-site is considered in this Record of Decision (ROD).

The selected remedial action for this site includes: removal and off-site disposal of approximately 300 drums on the surface of the CELA; excavation of the 2.3-acre SLA to a depth of approximately 20 feet to remove all waste material; filling of the excavated area with clean fill; consolidation of the excavated SLA wastes onto the CELA; RCRA capping of the consolidated wastes on the CELA; partial channelization of the Genesee River to protect the landfill from erosion and flooding; and erection of a fence to secure the entire landfill area. Total capital cost for the selected remedial alternative is estimated to be $8,759,000 with O&M costs approximately $30,000 per year. A separate ROD will be prepared to address cleanup of the refinery area once the Feasibility Study is complete.

PERFORMANCE STANDARDS OR GOALS: Water-related remedial response criteria were based upon published State ground water standards and ambient water quality criteria for potable water supplies for the constituents found in ground and surface water samples. In general, contaminated ground water beneath the landfill site, surface water within the site and the Genesee River will be controlled such that perimeter monitoring wells or river samples show total organics concentrations of 100 ppb. Remedial criteria for ground and surface water contaminants include: toluene 10 ppb; 1,1,1-trichloroethane 50 ppb; arsenic 5 ppb; zinc 30 ppb; PCBs .0095 ppb. Soil criteria were calculated based on State ambient water quality criteria, compound solubilities in water, and soil/water partition coefficients. Remedial criteria for soils included: toluene 72 ppb; Trans-1,2-dichloroethylene 325 ppb; arsenic 15,000 ppb; zinc [illegible]3,000 ppb; PCBs 12.1 ppb.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: Consolidation -- Excavated wastes from the SLA will be consolidated on the CELA and capped.

SINCLAIR REFINERY, NY
(Continued)

KEYWORDS: Arsenic; Capping; Chromium; Excavation; Ground Water; Heavy Metals; Inorganics; Organics; PCBs; Phenols; Soil; State Criteria; Surface Water; Toluene.

SWOPE OIL COMPANY, NJ
September 27, 1985

ROD ABSTRACT

The Swope Oil Company site is located in an industrial complex in northern Pennsauken Township, Camden County, New Jersey. Swope Oil operated a chemical reclamation operation at this two-acre site from 1965 until December 1979. Operations included buying, selling, dealing in, manufacturing, and processing, chemicals, chemical compounds and paints. Products processed at the site included phosphate esters, hydraulic fluids, paints and varnishes, solvents, oils, plasticizers, and printing inks. Waste liquids and sludges from the Swope Oil operation were discharged to an excavated, unlined lagoon. Contaminated material was also ponded within a diked tank farm and in an exposed drum storage area. The company, which ceased operation in December 1979, has declined to take any action at the site.

The cost-effective remedial actions selected for this site include: construction of a cap; preparation of a supplemental RI/FS to evaluate the extent of ground water contamination and to develop and evaluate appropriate remedial alternatives; removal of tanks and buildings with offsite incineration, treatment (aqueous wastes) or disposal (non-incinerable wastes) of tank contents, and offsite disposal of tanks and building debris; excavation and offsite disposal of the buried sludge waste area; excavation of up to 1.5 feet of contaminated soil containing PCBs greater than 5ppm and offsite disposal; excavation of up to 1.5 feet of contaminated soils below the lagoon containing PCBs greater than 5ppm and offsite disposal (this remedial action will be reevaluated should removal of 1.5 feet of soil not achieve the 5ppm goal); and sampling, excavation and offsite disposal of contaminated soils containing greater than 5ppm PCBs in the parking lot area and along the railroad right-of-way adjacent to the lagoon. The estimated total capital cost for this remedial action is $5,590,356 and the O&M costs are estimated to be $33,000 per year.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup to 5 ppm for PCBs which is consistent with State of New Jersey policy. Draft EPA policy will establish a cleanup level of 10 ppm. The incremental cost of excavation to 5 ppm is insignificant due to the rapid decrease in PCB concentrations with depth.

INSTITUTIONAL CONTROLS: Not Specified.

COMMENTS: Offsite Disposal -- Excavated materials will be transported for disposal at approved RCRA and TSCA facilities. Approximately 145 cubic yards of PCB contaminated soil will be disposed of at the TSCA facility.

KEYWORDS: Capping; Excavation; Ground Water; Incineration; Offsite Disposal; Organics; PCBs; Sludge; Soil; State Criteria.

WIDE BEACH, NY
September 30, 1985

ROD ABSTRACT

The Wide Beach Development site is a small lakeside community located in the Town of Brant, in southern Erie County, New York. Between 1968 and 1978 approximately 155 cubic meters of waste oil, some of which was contaminated with Polychlorinated Biphenyls (PCBs), was applied to the local roadways for dust control by the Wide Beach Homeowners Association. The source of the contaminated waste oil is being investigated, however, drums labeled as dielectric coolant were found onsite. In 1980, the installation of a sanitary sewer line in the development resulted in the excavation of highly contaminated soil from the roadways and their vicinity. Because it was not known at that time that a PCB problem existed, excavated soil was used as fill in several yards and in a community recreation area. Subsequent sampling revealed the presence of PCBs in the air, roadway dust, soil, vacuum cleaner dust, and water samples from private wells.

The selected remedial action for this site includes: excavation of soils in the roadway with PCB concentrations greater than 10 mg/kg to a depth of approximately 0.5m from the base of the existing asphalt roadway surface (installed as part of an immediate removal action), in the drainage ditch to a depth of approximately 1m, in the driveways to 30cm, in the yards to a depth of approximately 15cm, and in the wetlands to a depth of approximately 20cm; excavation and disposal of contaminated asphalt material, retaining uncontaminated material for reuse in repaving; chemical treatment of the PCB-contaminated soils and reuse as fill in the excavated areas; repavement of the roadways and driveways; treatment of the perched water in the sewer trench; construction of a hydraulic barrier at the end of the sewer trench; conducting a pilot plant treatability study to determine an effective treatment scheme for chemically neutralizing the PCB-contaminated soils; and sampling for PCBs in soils from the back yards, the sewage lift station, and sediments in the disconnected septic systems to better define the extent of the contamination. Total capital cost for the selected remedial alternative is estimated to be $9,295,000 with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: The remedial response levels for PCB contamination at the site are:

- Soil 10 mg/kg (EPA/NYSDEC soil removal criterion)
- Air 1.67 ug/m^3 (NY State ambient air level)
- Ground water 1.00 ug/l (NYSDOH advisory level)
- Surface water 7.9 x 10^{-5} ug/l (Clean Water Act ambient water quality criterion for 10^{-6} lifetime cancer risk).

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Alternative Technology; Excavation; PCBs; Soil; Wetlands.

DOUGLASSVILLE, PA
September 27, 1985

ROD ABSTRACT

The Douglassville Disposal site occupies approximately 50 acres of land along the southern bank of the Schuylkill River in southeastern Berks County, Union Township, Pennsylvania. Site operations included lubricating oil recycling in 1941 and waste solvents recycling in the 1950s and 1960s. Wastes generated from these operations were stored in several lagoons located in the northern half of the site until 1972. In November 1970, ten days of heavy rain caused the lagoons to overflow and breach safety dikes releasing 2-3 million gallons of wastes. The dikes were repaired and a Federal decree was issued stating that no more waste material was to be stored in the lagoons. Actions were also initiated to dispose of remaining waste materials. Before this action could be carried out, tropical storm Agnes caused the Schuylkill River to overflow its banks and inundate the entire site. An estimated 6 to 8 million gallons of wastes were released and carried downstream by floodwaters for about 15 miles. Oil recycling operations continued until 1979 when corrections mandated by the Pennsylvania Department of Environmental Resources (PADER) became cost-prohibitive. The site operators then turned to refining waste oils for use as fuel in industrial boilers, and oily waste sludge from this new recycling process was landfarmed in the area of the western lagoon. PADER halted this practice in 1981, and mandated operational corrections.

The selected remedial action for this site includes: removal and consolidation in the facility sludge disposal area of contaminated soils and sediments from the waste water treatment drainage ditch, drainage swale, buried lagoon and drum disposal area to a depth to be determined in the predesign study; capping of the former sludge lagoon area and the facility sludge disposal area in accordance with RCRA; installation of levees and dikes to protect the site from the 100-year flood in compliance with Executive Order 11988; a pre-design study of the contaminated soils to determine the extent of the areas to be capped and the extent of soils to be excavated from the drainage ditch areas. Total capital cost for the selected remedial alternative is estimated to be $5,569,500 with O&M costs approximately $196,000 per year. Ground water pumping and treating and construction of the slurry wall are being deferred until a supplemental RI/FS is completed.

PERFORMANCE STANDARDS OR GOALS: Pre-design borings will be taken to determine the vertical extent of contamination. Background concentrations for arsenic, cadmium, chromium, lead and mercury were identified by sampling and through literature. Cleanup criteria for PCBs, phthalate esters, PAHs, pesticides and volatile organics were not identified.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Consolidation -- The selected action involves consolidating contaminated soils and sediments into the facility sludge disposal area to prevent further ground water contamination. Since the sludge disposal area is contaminated with the same types of substances as other areas onsite, consolidation of wastes is in compliance with RCRA.

KEYWORDS: Acids; Arsenic; Capping; Chromium; Deferred Decision; Excavation; Ground Water; Inorganics; Levees; PCBs; Pesticides; Phenols; Polynuclear Aromatic Hydrocarbons (PAH); Sediments; Soils; Surface Water; VOCs.

HARVEY-KNOTT, DE
September 30, 1985

ROD ABSTRACT

The Harvey-Knott Drum site is located in New Castle County, Delaware, approximately one-half mile east of the Maryland-Delaware border. Harvey and Knotts Trucking, Inc., operated an open dump and burning ground on the site between 1963 and 1969. The facility accepted sanitary, municipal, and industrial wastes believed to be sludges, paint pigments, and solvents. Wastes were emptied onto the ground, into excavated trenches, or left in drums (some of which were buried). Some of these wastes were either burned as a means of reducing waste volume, or allowed to seep into the soil. Contamination of soil, surface water, and ground water has occurred as a result of disposal of these industrial wastes.

The selected remedial action for this site includes: cleaning the onsite drainage pond by collecting and treating surface water; removal and offsite disposal of contaminated sediments, sludges, and bulk wastes to a qualifying RCRA facility; removal and offsite disposal of all crushed or intact surface drums, debris, wastepiles, and sludges to a qualifying RCRA facility; installation of ground water extraction and treatment facilities to collect and remove contaminants in the shallow ground water; applying treated ground water to flush contaminants from onsite surface and subsurface soils; and preparation of the site surface for installing the flushing pipe network which entails (a) grading the entire application area, (b) covering the area with a 24-inch layer of clean soil, and (c) establishing permanent vegetation as a precaution against direct contact. Total capital cost for the selected remedial alternative is estimated to be $3,572,000. Decisions on the extent of aquifer restoration, cleanup actions in offsite streams and wetlands, and final site closure will be deferred pending (a) additional soil investigation during design, (b) analyses on the effectiveness of the chosen alternative and (c) the impacts of the site on the adjacent wetlands.

PERFORMANCE STANDARDS OR GOALS: Target soil and Alternate Concentration Levels (ACLs) for ground water contamination will be established during the design phase. Final levels will be determined as additional information is gained through operation of the systems.

INSTITUTIONAL CONTROLS: Institutional controls are applicable at this site but will be addressed in a future Record of Decision.

COMMENTS: Offsite Disposal -- Wastes will be landfilled offsite in a RCRA-permitted facility.

KEYWORDS: Ground Water; Ground Water Treatment; Heavy Metals; Inorganics; Offsite Disposal; Organics; PCBs; Soil; Surface Water; Surface Water Collection; Wetlands.

HELEVA LANDFILL, PA
March 22, 1985

ROD ABSTRACT

The Heleva Landfill site consists of a 20-acre landfill located on a 93-acre tract of land in Lehigh County, Pennsylvania. The site is surrounded primarily by farm and pasturelands, with the village of Ormrod (population approximately 100) and town of Ironton (population 150) located approximately one quarter mile away. The site began operations as a sanitary landfill in 1967, accepting 250-350 tons/day of mixed refuse including paper, wood, and orchard wastes. In addition, industrial wastes with high levels of trichloroethylene (200 ug/l) were sent to the site as early as 1967. The site was closed in May of 1981 by the Pennsylvania Department of Environmental Resources because of operational deficiencies.

The selected remedy for the Heleva Landfill site consists of extending an existing water main from Ormrod to Ironton, capping the entire 20-acre landfill according to RCRA standards, constructing surface water diversion and gas venting systems, conducting a pre-design study to fully delineate the source of contamination and determine sinkhole activity, constructing a treatment facility onsite, pumping and treating highly contaminated ground water, monitoring and sampling existing wells and surface water, and conducting operation and maintenance for a period of at least two years. The total capital cost of the selected remedial alternative is estimated to be $7,253,000. Annual O&M costs are estimated to be $62,000.

PERFORMANCE STANDARDS OR GOALS: The following cleanup criteria were defined for the contaminated ground water: TCE 1.8-5.0 ppb; PCE 1.0 ug/l; Vinyl Chloride 2.0 ug/l; 1,1,1-Trichloroethane 21.7 ug/l; Toluene 15,000 ug/l.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: ROD Addendum -- If contaminant targets are not reached after two years of pumping and treating the ground water, the RA will make a decision on the technical feasibility of reaching the targets. If the targets cannot be met, they may need to be adjusted.

KEYWORDS: Air; Capping; Ground Water; Ground Water Treatment; Hydrogeologic; Surface Water; Surface Water Diversion/Collection; Tetrachloroethylene (PCE); Trichloroethylene (TCE); Venting.

LACKAWANNA REFUSE SITE, PA
March 22, 1985

ROD ABSTRACT

The Lackawanna Refuse site is located along a section of the north-south border between the Borough of Old Forge and Ransom Township, in Lackawanna County, PA. Five strip mine pits of five to six acres each were excavated in this area during the last century, and three were later used for waste disposal in the 1970s. One abandoned pit (Pit 5) contains about 15,000 buried drums of hazardous waste as well as municipal refuse. Pit 5 is approximately five acres and is estimated to be 30-50 feet deep. The pit has only a thin cover of soil above the waste. The contents of 20 drums were sampled and found to contain various solvents, paints and thinners, sludges, organic acids, and toxic metals.

The selected remedial action includes: removal of all drums and highly contaminated municipal refuse from Pit 5 for disposal at a RCRA-regulated facility (Excavated material from Pit 5 would be incinerated if adequate incinerator capacity is available; if not, only liquids would be incinerated, and solids would be landfilled in compliance with RCRA requirements); clay capping (with gas venting systems) of Pits 2, 3, and 5; installation of surface water drainage diversions and construction of a leachate collection and treatment system for all three pits; removal and disposal of the top layer of contaminated soil from the bore hole pit and the access road; reconstruction of the road with appropriate drainage and sedimentation controls; and removal of the dried paint and contaminated soil in the paint spill area for offsite disposal at a RCRA regulated facility. The estimated total project capital cost for these remedial actions is $12.5 million.

PERFORMANCE STANDARDS OR GOALS: Excavation limits will be determined by background contaminant levels found in "clean area" soil borings.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Acids; Capping; Incineration; Offsite Disposal; Sludge; Soil; Solvents; Surface Water.

LANSDOWNE RADIATION, PA
August 2, 1985

ROD ABSTRACT

The Lansdowne Radiation site consists of a duplex located at 105/107 East Stratford Avenue in Lansdowne, Pennsylvania. The building is located on a side street in a residential area, approximately two miles from Philadelphia. The dwellings are contaminated with radium and other radionuclides as the result of work done in one of the houses to refine radium and produce medical devices from 1924 through 1944. Radiation levels in the houses exceed current EPA guidelines and the Centers for Disease Control has issued a Public Health Advisory which states that, "..exposure levels are in excess of those considered safe for human habitation."

The selected remedial action includes permanent relocation of the residents in 105 and 107 East Stratford Avenue. This will entail purchasing the property at fair market value under the Uniform Relocation Act. There will be no O&M costs associated with this action.

PERFORMANCE STANDARDS OR GOALS: EPA guidelines for permissible levels of radiation are: gamma 0.17 rem/year; radon 0.03 working levels; soil activity 5-15 pCi/g.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: N/A

KEYWORDS: Public Exposure; Public Health Advisory; Radioactive Materials; Relocation; Soil; Wood.

MCADOO ASSOCIATES, PA
(Second Remedial Action)
June 28, 1985

ROD ABSTRACT

The McAdoo Associates site is an eight-acre track of land located in Schuylkill County in northeastern Pennsylvania. It is situated approximately 1 1/2 miles south of McAdoo Borough on U.S. Route 309. The site and adjacent area was once used extensively for deep and strip mining of anthracite coal. Mining activities started in 1884 and continued periodically until 1962. After the site was acquired by McAdoo Associates in January 1975, two rotary-kiln furnaces and a vertical liquid waste incinerator were installed and operated as part of a metals reclaiming operation. A log maintained by McAdoo Associates shows acceptance of a variety of wastes from January 1977 through November 1978. These wastes include: paint sludge, spent solvents, metallic sludges, acid and caustic liquids, toluene, waste oil/water, solid wastes and other miscellaneous residuals. None of the incoming waste streams received prior to January 1977 were logged into the facility.

The selected remedial action for the McAdoo site includes: removal of the tank and debris; limited excavation of soils with offsite disposal in a RCRA facility; capping; diversion of surface water and maintenance of surface water diversion ditches and cover. In addition, a comprehensive mining engineering study to determine appropriate cap design and an evaluation of the dilution factor will be undertaken during the design phase. The total capital cost for the selected remedial alternative is estimated to be $2,360,000. O&M costs will be determined once the mining engineering study is complete.

PERFORMANCE STANDARDS OR GOALS: Excavation of hot spots which exceed selected soil contamination criteria as defined in the ROD (i.e., Cadmium 0.2 ppb; Chromium 809 ppb; Cyanide 33 ppb).

INSTITUTIONAL CONTROLS: N/A

COMMENTS: ROD Addendum -- If the results of the mining engineering study conclude that subsidence is significantly different than anticipated, the selected remedial action will be reevaluated and a ROD Addendum prepared, if necessary.

KEYWORDS: Capping; Cleanup Criteria; Deferred Decision; Excavation; Ground Water; Mining; Offsite Disposal; RCRA 264; ROD Addendum; Sludge; Soil; Solvents; Subsidence; Surface Water; Toluene.

MOYER LANDFILL, PA
September 30, 1985

ROD ABSTRACT

The Moyer Landfill is an inactive privately owned landfill located in the Lower Providence Township in Montgomery County, Pennsylvania. The site was operated as a municipal landfill from the 1940s until April 1981, during which time it received municipal refuse and sewage sludges. According to local Federal Bureau of Investigation (FBI) officials, the landfill accepted a variety of solid and liquid hazardous wastes, including polychlorinated biphenyls (PCBs), solvents, paints, low-level radioactive wastes, and incinerated materials in bulk form and/or containerized in drums. In 1972, when the Pennsylvania Department of Environmental Resources (PADER) rules and regulations became more restrictive, this landfill was cited, and finally in 1981, it was closed and brought into receivership of the U.S. District Court.

The selected remedial action for this site includes: interim soil/clay capping, composed of a material having a permeability of $10^{-4}/10^{-5}$ cm/sec to a depth of 36"; erosion and sedimentation control measures; surface water diversion; leachate collection treatment and discharge; extraction, scrubbing and upgrading methane gas for delivery to the Philadelphia Electric Company (PECO); security/fencing measures; ground water monitoring; and all closure activities in compliance with RCRA at the conclusion of the gas generation phase (10 to 20 years). Total capital cost for the selected remedial alternative is estimated to be $6,298,500 with O&M costs approximately $332,000 per year. This alternative contemplates broad remedial work and its implementation will depend upon the success of the gas generation/recovery program and the contributions from generators and other potentially responsible parties (PRPs).

If negotiations with the PRPs fail and/or the methane gas alternative fails, EPA and PADER recommend: miscellaneous work preparatory to installation of a RCRA cap (grading, flattening of steep slopes, retaining walls and installation of rip-rap at areas that are most likely to be eroded); gas venting and monitoring; surface water collection and discharge to Skippáck Creek; leachate collection and treatment that will meet the 10^{-6} risk level in the ground water and discharge requirements in the stream; ground and surface water monitoring; and maintenance of the cap. Total capital cost for this alternate remedial action is estimated to be $15,384,800 with O&M costs of $343,100 per year.

PERFORMANCE STANDARDS OR GOALS: Through the methane gas recovery system, approximately 1.5 million cubic feet per day of raw landfill gas can be generated for a period of close to a decade. The 1.5 million cubic feet of gas per day is estimated to have a methane content of 58% and, after processing, approximately 625,000 to 700,000 cubic feet of pipeline standard gas per day could be available for introduction into the PECO pipeline. In addition, the leachate collection system, for both alternatives, will be designed to meet the 10^{-6} risk level in the ground water and appropriate discharge requirements in the streams.

MOYER LANDFILL, PA
(Continued)

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Arsenic; Capping; Ground Water; Ground Water Monitoring; Heavy Metals; Leachate Collection/Treatment; PRP; Radioactive Materials; RCRA Closure Requirements; Surface Water; Surface Water Diversion/Collection; Toluene; Trichloroethylene (TCE); Venting; VOCs.

SAND, GRAVEL AND STONE, MD

September 30, 1985

ROD ABSTRACT

The Sand, Gravel and Stone site consists of approximately 200 acres, and is located in Elkton, Cecil County, Maryland. The site was previously operated as a sand and gravel quarry under the name Maryland Sand and Gravelstone Company. Currently, the site is occupied by the Sand, Gravel, and Stone Company. It was reported that about three acres onsite were used for the disposal of waste processing water, sludge, still bottoms, and about 90 drums of solid and semisolid waste between 1969 and 1974. On July 16, 1974, 1,300 gallons of flammable products in drums were reportedly received and dumped. On August 5, 1974, 5,000 gallons of nonflammable materials were received at the site. Pits, excavated onsite, were used as surface impoundments, where approximately 700,000 gallons of waste were dumped.

Remedial measures at the site will be implemented in two phases. Selected remedial actions approved at this time include: excavation and offsite disposal of buried materials (drums and/or trucks) at an approved RCRA facility; installation of shallow ground water interceptors downgradient from the waste sources; collection and treatment of contaminated ground water; recirculating the treated effluent to the ponds and shallow aquifer or discharging to Mill Creek. Total capital cost for the selected remedial alternative is estimated to be $7,095,000 with O&M costs approximately $753,000 per year. The decision on the remedial measures for the contaminated soils, the lower unconsolidated sand and bedrock aquifers, final site closure requirements and post closure operations and maintenance activities has been deferred until the Phase II RI/FS is completed.

PERFORMANCE STANDARDS OR GOALS: Treatment and discharge of ground water will continue until heavy metal and organic compound levels in the shallow ground water aquifer reach background levels, an acceptable cancer risk level (10^{-6}), or meet standards set by the Agency.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: 1) Offsite Disposal -- Drums will be disposed of offsite at a RCRA-approved facility. 2) Consolidation -- Soils excavated as a result of trench construction will be consolidated onsite.

KEYWORDS: Excavation; Ground Water; Heavy Metals; Offsite Disposal; Phenols; Sediments; Soil; Surface Water; VOCs.

TAYLOR BOROUGH, PA
June 28, 1985

ROD ABSTRACT

The Taylor Borough site is located at the toe of Bald Mountain, approximately three miles south of the City of Scranton. The population within a one mile radius of the site is estimated to be 1,007 persons with approximately 265 residential dwellings. The site is situated on a tract of land that was previously coal mined and left unreclaimed with numerous open and surface mine spoil pits. Subsequent to the mining activities, unreclaimed portions of the 125-acre site were used for a municipal landfill operation by the City of Scranton. Municipal waste was disposed in pits and spoil material was used as a cover. As a result of the landfill operation, which ceased in 1968, the topography of the site consists of relatively rolling terrain between steep slopes of mine spoil piles and unreclaimed pits. In addition, after the landfill operation ceased, drummed industrial wastes were found on the surface of the site.

The selected remedial action includes: removal and offsite disposal of approximately 125 crushed and intact drums, as well as their remnants, to a qualified RCRA facility; collection and treatment of contaminated surface water; excavation of contaminated soils and wastes from the former drum storage areas for offsite disposal to a qualified RCRA facility; backfilling and placement of a 24-inch soil cover over the former drum storage areas and installation of a chain link fence around the perimeter of both soil covered areas. Total capital cost is estimated to be $4,237,000. O&M costs are not specified in the ROD.

PERFORMANCE STANDARDS OR GOALS: Excavation of contaminated sediments, soils, and wastes to background levels in the former drum storage areas and Ponds 1 and 2.

INSTITUTIONAL CONTROLS: Restriction of future land use -- mechanism not specified in the ROD.

COMMENTS: 1) RCRA -- Strip and deep mining of coal have affected the site's foundation, possibly prohibiting the construction of a '264' landfill. In addition, there is a potential for subsidence or settlement from past underground mining activities. As a result, in order to close the facility, the cover material must have a permeability less than or equal to the permeability of the natural subsoils present. The soil cover will provide the same direct contact barrier as clay. 2) Offsite Disposal -- All excavated materials will be landfilled in a qualified RCRA facility.

KEYWORDS: Air; Benzene; Deferred Decision; Excavation; Filling; Monitoring; Offsite Disposal; Organics; Polynuclear Aromatic Hydrocarbons (PAH); Soil; Soil Cover; Subsidence; Surface Water; Toluene; Trichloroethylene (TCE).

TYSON'S DUMP, PA
December 21, 1984

ROD ABSTRACT

The Tyson's Dump site is located in southeastern Pennsylvania, approximately 15 miles northwest of Philadelphia. The dump is an abandoned septic and chemical waste disposal site which operated from 1960-1968. Unlined lagoons were filled with wastes and covered, and new lagoons were created. Major contaminants found at the site were volatile organic compounds (VOCs), primarily xylenes, toluenes, and 1,2,3-trichloropropane. In addition, chlorinated benzene compounds were detected.

The cost-effective remedial alternative selected for this site includes excavation and offsite disposal of contaminated soils and wastes; upgrading of the existing air-stripping facility to treat leachate, shallow ground water, and surface run-on; and excavation and offsite disposal of contaminated sediments within the tributary which receives effluent from the existing air-stripping facility. The estimated capital cost for the selected alternative is $10,718,000 and operation and maintenance costs for five years are estimated to be $351,000.

PERFORMANCE STANDARDS OR GOALS: Excavation of unconsolidated material down to bedrock and lateral excavation based on detectable background levels.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: 1) Offsite Disposal -- Contaminated materials will be disposed of offsite at a double lined, RCRA-permitted landfill in compliance with the current offsite disposal policy. 2) Additional studies required -- Further studies will be conducted to determine if removal of surface soils on the hillside will be necessary.

KEYWORDS: Air Stripping; Capping; Chlorinated Benzenes; Deferred Decision; Excavation; Ground Water; Interim Measure; RCRA Landfill Standards; RCRA Locational Guidance; Soil; Stream Sediments; Surface Water; VOCs.

AMERICAN CREOSOTE, FL
September 30, 1985

ROD ABSTRACT

The American Creosote Works, Inc. (ACW) site occupies approximately 12 acres in a moderately dense, commercial and residential district of Pensacola, Florida. Wood-preserving operations were carried out at the ACW site from 1902 until December 1981. Prior to 1950, creosote was exclusively used to treat poles. Use of pentachlorophenol (PCP) started in 1950 and steadily increased during later years. During its operations, liquid process wastes were discharged into the two unlined, onsite surface impoundments. Prior to 1970, waste waters in these ponds were allowed to overflow through a spillway and follow a drainage course into Bayou Chico and Pensacola Bay. In subsequent years, waste waters were periodically drawn off the ponds and discharged into designated "spillage areas" on site. Additional discharges occurred during periods of heavy rainfall and flooding, when the ponds overflowed the containment dikes. Data gathered during the RI indicate that major contaminants in the ground water are aromatic hydrocarbons common to creosote, such as, polycyclic aromatic hydrocarbons (PAHs), benzene, ethylbenzene, toluene, and xylene. In addition, onsite soil samples show that the areas where wood-preserving operations were carried out are contaminated with PAHs.

The selected remedial action for this site includes excavation of all contaminated soils and sludges, both on and offsite, with consolidation and onsite disposal in a landfill that meets RCRA standards. Total capital cost for the selected remedial alternative is estimated to be $5,678,000 with annual O&M costs approximately $50,000 for years 1-5 and $19,000 for years 6-30. At a later date, the Agency will consider a second operable unit which will involve the selection of an alternative for the management of migration of contaminants in the ground water at the site. Operable units I and II will be the basis for the site's remedial design.

PERFORMANCE STANDARDS OR GOALS: Excavation of contaminated soils and sludges to maximum concentration levels of 12.0 mg/kg Polycyclic Aromatic Hydrocarbons (PAHs) and 0.13 mg/kg benzene.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: 1) ROD Addendum -- The State of Florida will evaluate whether the use of other alternatives is possible for portions of the contaminated material presently onsite. These alternatives would be implemented through use of the State Fund or a combination of the State Fund and CERCLA.
2) Consolidation -- Contaminated soils being excavated from areas off the site will be combined with contaminated soils and sludges from areas on the site. These consolidated contaminated soils and sludges will then be placed into an onsite landfill constructed to RCRA design standards.

KEYWORDS: Arsenic; Consolidation; Deferred Decision; Excavation; Ground Water; Heavy Metals; Onsite Disposal; Polynuclear Aromatic Hydrocarbons (PAHs); RCRA Landfill Specifications; Sediments; Sludge; Soil; Toluene; VOCs.

BISCAYNE AQUIFER SITES, FL
September 16, 1985

ROD ABSTRACT

The Biscayne Aquifer is the sole source of drinking water for 3 million residents of southeast Florida. It is a highly permeable, wedge-shaped, unconfined shallow aquifer composed of limestone and sandstone.

Three Biscayne Aquifer hazardous waste sites on the EPA's National Priorities List were addressed as one management unit for the remedial investigation and feasibility study: (1) Miami Drum Site, (2) Northwest 58th Street Landfill, and (3) Varsol Spill Site. These sites are located near each other in north Dade County, Florida. The remedial actions for the three hazardous waste sites are being addressed in four phases:

Phase I:	Varsol Spill Site--immediate area soil and ground water. Record of Decision (ROD) signed 3/29/85.
Phase II:	Miami Drum--source control (soils and encountered ground water), completed September 1982. ROD signed 9/13/82.
Phase III:	58th Street Landfill--immediate area soil, surface water, and ground water Enforcement Decision Document (EDD) planned.
Phase IV:	Study Area Ground Water--ROD signed 9/16/85.

The selected remedial action for Phase IV includes adding air stripping to the existing water treatment system in the study area and operating the Miami Springs and Preston municipal wells for the dual purpose of providing potable water and recovering contaminated water from the aquifer. Total capital cost for the selected remedial alternative is estimated to be $5,268,000 with O&M costs approximately $334,400 per year.

PERFORMANCE STANDARDS OR GOALS: Cleanup goals for Biscayne Aquifer have been recommended for 50 priority pollutants including the following: PCBs, 8.0×10^{-5} ug/l; Arsenic, 50 ug/l; Lead, 50 ug/l; Mercury, 2 ug/l; Vinyl chloride, 1 ug/l; TCE, 28 ug/l; PCE, 9 ug/l; Benzene, 0.7 ug/l; Phenol, 3.5 mg/l; Pyrene, 0.2 ug/l. These goals are based on EPA primary drinking water standards, EPA criteria for cancer risk (10^{-6}) and other studies noted in the ROD.

INSTITUTIONAL CONTROLS: Dade County prohibits discharges to surface and ground waters that adversely affect water quality. Dade County also controls well installation and operation. A supplemental institutional control called the Biscayne Aquifer Protection Plan was proposed for action. This plan would provide County-level responsibility for ensuring adequate consideration of waste issues not addressed by Federal or State agencies. These issues include waste generated by homeowners, small industries and individuals that affect the Biscayne Aquifer water quality.

COMMENTS: Extent of CERCLA response -- The extent of CERCLA response must be established when there is an area wide problem with multiple contaminating sources, both CERCLA and non-CERCLA. Source control remediation cannot be ensured at non-NPL sites under CERCLA. Aquifer contamination from non-NPL sources will continue until non-CERCLA source control measures can be implemented. Institutional controls must also be implemented to restrict future aquifer use.

KEYWORDS: Air Stripping; Aquifer Use Restrictions; Ground Water; Institutional Controls; Sole Source Aquifer; Trans-1,2-dichloroethylene; Vinyl Chloride; VOCs.

DAVIE LANDFILL, FL
September 30, 1985

ROD ABSTRACT

The Broward County Solid Waste Disposal facility (a.k.a. Davie Landfill) is located 10 miles southwest of Fort Lauderdale, Florida near the intersection of Orange Drive and Boy Scout Road. The landfill area includes a 50-acre garbage landfill, an 80-acre trash landfill and a 56-acre sludge lagoon. The facility began operation in 1964 accepting trash and ash from the county's adjacent garbage incinerator. In November 1971, a lagoon was created in an unlined natural depression onsite. Grease trap pump-outs and septic tank and treated municipal sludges were disposed in the lagoon which contains an estimated 75,000 cubic yards of sludge. Initial sampling of the lagoon contents characterize the waste as being in the high range of typical waste water treatment plant sludge hazardous constituents. In addition, concerns have been raised about the relatively high cyanide and sulfide concentrations detected.

The selected remedial action includes: dewatering and stabilization of the sludge lagoon contents and placement in a single lined sanitary landfill cell and installation of a cap on the cell that meets the regulatory requirements of 40 CFR 264.310(a). This ROD addresses only source control measures. The decision concerning cleanup of ground water contamination will be made following an evaluation of these actions and monitoring data. Total capital cost for the selected remedial action is estimated to be \$3.0-\$3.7 million with annual O&M costs of \$100,000.

PERFORMANCE STANDARDS OR GOALS: The following cleanup goals have been recommended to prevent potable water contamination from exceeding applicable drinking water standards or a cancer risk level of 10^{-6}: Lead, 1000 ppm; Chromium, 25 ppm; Cadmium, 25 ppm; Arsenic, 2 ppm; Mercury, 20 ppm. These levels will be reexamined in the remedial design to verify calculations and to address other contaminants as needed.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Arsenic; Capping; Chromium; Cyanide; Deferred Decision; Ground Water; Hazardous Constituents; Onsite Containment; Sludge; Sulfide.

VARSOL SPILL SITE, FL
March 29, 1985

ROD ABSTRACT

The Biscayne Aquifer is the sole source of drinking water for three million residents of southeast Florida. Three Biscayne Aquifer hazardous waste sites on the EPA National Priorities List were addressed as one management unit for the remedial investigation and feasibility study (RI/FS): 1) Varsol Spill Site (Miami International Airport), 2) Miami Drum Site, and 3) Northwest 58th Street Landfill. The Varsol Spill Site is located in the northeast section of Miami International Airport (MIA). Industrial operations associated with a typical commercial airport have resulted in hydrocarbon contamination of surface and ground waters in the vicinity of MIA. Since 1966 there have been approximately 15 hydrocarbon spills and leaks totalling approximately 2 million gallons, including the loss of an estimated 1.5 million gallons of varsol. In 1970, an unknown amount of jet fuel was spilled into a drainage canal onsite. In April 1981, construction activities revealed a thick hydrocarbon layer floating on the water table in an excavated trench. One responsible party installed 54 shallow observation wells. Sampling results showed that the hydrocarbon layer diminished with time. In another area, Dade County installed 43 monitoring wells to determine the extent and magnitude of jet fuel spilled. Recovery operations for this jet fuel are currently underway.

The remedial investigation of the site showed no trace of varsol in and around the airport at this particular time, thus the recommended alternative for this site is no action. Several factors probably contributed to the dissipation of the hydrocarbon layer in the aquifer. For example, some of the solvent was recovered, biodegradation is believed to have taken place, and the hydrology of the area indicates that some of the solvent contributed to and became part of the "background" contamination in the aquifer. A separate ROD was prepared in September 1985 to address the area "background" contamination (see Biscayne Aquifer Sites, FL).

PERFORMANCE STANDARDS OR GOALS: N/A

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Ground Water; No Action.

WHITEHOUSE WASTE OIL PITS, FL
May 30, 1985

ROD ABSTRACT

The Whitehouse Waste Oil Pits site is located near the community of Whitehouse, FL and occupies approximately seven acres of an upland area immediately adjacent to a cypress swamp. Two major east-west highways, U.S. Highway 90 and Interstate 10, are approximately 0.5 miles south of the site. A low-density residential area is located west and northwest of the site. The site itself consists of seven unlined pits, constructed by Allied Petroleum, where waste oil sludge, acid and contaminated waste oil from an oil reclaiming process were disposed. The first pits were con- structed in 1958, and by 1968 the company had constructed and filled seven pits with approximately 127,000 cubic yards of waste. Allied Petroleum then went bankrupt. Consequently, the pits were abandoned, and remained an "open dump" for several years. Recent activities have increased the volume of contaminated material to an estimated 240,000 cubic yards.

The selected remedial action includes: construction of a slurry wall around the entire site; recovery and treatment of contaminated ground water; removal of the contaminated sediments from the northeast tributary of McGirts Creek; and capping the entire site. Total capital cost for the selected remedial alternative is estimated to be $3,049,000 and operations and maintenance costs are estimated to be an additional $96,630 per year.

PERFORMANCE STANDARDS OR GOALS: No specific cleanup goals were defined in the Record of Decision. Response objectives were defined as follows: Ground water quality should meet Florida Department of Environmental Resources (FDER) Primary Drinking Water Standards; surface water quality should meet State water quality standards; and soil and sediment contaminant migration offsite should be treated to background levels or minimal risk levels.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Consolidation -- Waste sediments excavated from the northeast tributary of McGirts Creek will be consolidated onsite in the waste contaminant area bounded by the slurry wall.

KEYWORDS: Arsenic; Capping; Chromium; Ground Water; Ground Water Treatment; O&M; Phenols; Polynuclear Aromatic Hydrocarbons (PAH); Slurry Wall; Soil; Surface Water.

A&F MATERIALS COMPANY, IL (EDD)
June 14, 1985

ROD ABSTRACT

The A&F Materials site is located on three and three quarter acres of land on West Cumberland Street in Greenup, Illinois. The site is bounded by open farmland/woodland, the Village of Greenup waste water treatment plant, and private residences. In addition, the City of Newton occasionally withdraws drinking water from the Embarras River, which is located twenty-one miles downstream from the site. The A&F Materials facility began operation in March 1977 and continued until it shut down in 1980. The operation processed waste materials (including, but not limited to oil, sludge, caustic and sulfuric acid) into fuel oil and fire retardant chemicals. During the course of operations, there were numerous violations of the permit issued to A&F Materials by the Illinois Environmental Protection Agency. By March 1978, four storage lagoons began to overflow, contaminating soil and drainage pathways leading to the Embarras River. In addition, twelve steel storage tanks containing a mixture of waste oils, sludges, spent caustics, spent acids, contaminated water and other waste products were located on site. These tanks failed on several occasions, releasing their contents into the surrounding environment.

The selected remedial action includes: removal and disposal of all soils contaminated over the recommended action levels, including soils containing greater than 1 ppm PCBs; monitoring of the ground water; cleaning and removal of onsite equipment and buildings; testing and disposal of soil underlying the building if it is found to be contaminated above the recommended action levels; grading of the site; and removing the fence surounding the site. Total capital cost for the selected remedial alternative is estimated to be $824,000. Consenting defendants are required to submit an O&M plan for approval.

PERFORMANCE STANDARDS OR GOALS: All soils containing greater than 1 ppm PCBs will be removed. Action levels have been recommended for 25 key soil contaminants. Among them are: benzene, 1 ug/gm; toluene, 12 ug/gm; trichloroethylene, 1 ug/gm; pyrene, 1 ug/gm; napthalene, 2 ug/gm; chromium, 80 ug/gm; cadmium, 5 ug/gm.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Offsite Disposal -- Wastes and building debris will be disposed of at an EPA-approved facility.

KEYWORDS: Excavation; Filling; Ground Water Monitoring; Heavy Metals; Offsite Disposal; Organics; PCBs; Soil; Surface Water.

ACME SOLVENTS, IL
September 27, 1985

ROD ABSTRACT

The Acme Solvents Reclaiming, Inc. facility is located approximately five miles south of Rockford, Illinois. From 1960 until 1973, the facility served as a disposal site for paints, oils and still bottoms from the solvent reclamation plant located in Rockford. In addition, empty drums were stored onsite. Wastes were dumped into depressions created from either previous quarrying activities or by scraping overburden from the near surface bedrock to form berms. In September 1972, the Illinois Pollution Control Board (IPCB) ordered Acme to remove all drums and wastes from the facility and to backfill the lagoons. Follow-up inspections revealed that wastes and crushed drums were being left onsite and merely covered with soil. Sampling of the site revealed high concentrations of chlorinated organics in the drinking water. The major source of hazardous substances at the facility are the waste disposal mounds. These mounds contain volatile and semi-volatile organic compounds and PCB concentrations of up to several hundred mg/kg.

The selected remedial action for this operable unit includes: a provision for an interim alternate water supply to affected residences by installation of home carbon treatment units; excavation and incineration of waste materials and contaminated soils, with disposition of non-incinerable wastes to an offsite RCRA landfill; continued investigation of bedrock contamination and remediation; continued investigation of contaminated ground water; and performance of pump tests to evaluate the effectiveness and cost of plume control. Estimated capital costs will be determined during the design phase.

PERFORMANCE STANDARDS OR GOALS: The Soil Contaminant Evaluation Methodology (SOCEM) was used to estimate soil cleanup levels for several indicator chemicals.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Alternate Water Supply; Excavation; Ground Water; Incineration; Inorganics; Offsite Disposal; PCBs; SOCEM; Soil; Trichloroethylene (TCE); VOCs.

BYRON/JOHNSON SALVAGE YARD, IL
March 13, 1985

ROD ABSTRACT

The Byron/Johnson Salvage Yard site is located 4 miles southwest of Byron, Illinois and consists of 20 acres of woodlands in a rural, agricultural area. The yard operated during the 1960s and early 1970s as a salvage yard and unpermitted landfill. Domestic refuse and industrial drums have been collected and sometimes buried onsite. Ten surface water sampling points from nearby Woodland Creek and Rock River, and three ground water sampling points have yielded high concentrations of cyanide and other toxic chemicals including lead, arsenic, halogenated organics and low-level PCB's.

The selected remedy for this first operable unit consists of offsite disposal of all surface and buried drums, offsite disposal of highly contaminated soils which exhibit the EP toxicity characteristic, and in-situ treatment with sodium hypochlorite and ammonia of all contaminated soil containing greater than 1 ppm amenable cyanide. Offsite disposal would include disposal at a lined, RCRA-approved landfill and, if possible, incineration or treatment of liquids. Total capital cost for the selected remedial alternative is estimated to be $1,170,919. O&M costs are estimated to be $6,000 per year. (Since the ROD was approved, cost estimates for the disposal and transportation of contaminated materials have increased. Total capital cost for the selected remedial alternative is now estimated at $2,500,000.)

PERFORMANCE STANDARDS OR GOALS: Soils with leachate that have metal concentrations exceeding 100 times drinking water standards will be removed during this operable unit. Soil containing greater than 1 ppm amenable cyanide will be treated in-situ. The EP Toxicity characteristic will be used as an initial indicator for highly contaminated soils which will be removed. The ongoing RI/FS for ground water contamination will evaluate the need for additional soil removal.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Arsenic; Excavation; Heavy Metals; O&M; Offsite Disposal; Organics; PCBs; Soil.

CEMETERY DUMP, MI
September 11, 1985

ROD ABSTRACT

The Cemetery Dump site is located in Oakland County, Michigan, approximately 35 miles northwest of Detroit. The 4-acre site was a sand and gravel pit which had been backfilled. Citizen reports allege that approximately 300 to 600 barrels were dumped and buried onsite in the late 1960s or early 1970s. In September 1981, the Michigan Department of Natural Resources excavated and transported offsite approximately 20 to 30 barrel fragments. Analysis of the barrel contents indicated the presence of paint sludges, solvents, PCBs and oils.

This ROD is a source control remedial action that includes excavation and disposal of approximately 250 drums at an offsite RCRA facility. Total capital cost for the selected remedial action is estimated to be $1,883,261. Any additional remedial actions will be addressed in the final Record of Decision upon completion of the RI/FS.

PERFORMANCE STANDARDS OR GOALS: The objective of the selected action is to eliminate the threat of release from the contaminant source to a potential Class I aquifer and to remove the threat of contact to the surrounding community and the wildlife in the area.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Excavation; Inorganics; Offsite Disposal; Organics; Soil.

CHARLEVOIX, MI
(Second Remedial Action)
September 30, 1985

ROD ABSTRACT

The City of Charlevoix is located on the shores of Lake Michigan in Charlevoix County. The city's single municipal well supplies potable water to a year-round population of 3,500 which increases to approximately 5,000 during the summer tourist season. In September 1981, while conducting tests for trihalogenated methane compounds, the Michigan Department of Public Health (MDPH) detected trichloroethylene (TCE) ranging in concentrations from 13 to 30 ppb in the Charlevoix water supply. Data from the monitoring program showed gradually rising levels of TCE in the raw water. Although not present in the municipal well, tetrachloroethylene (PCE) was subsequently detected in the aquifer. In June 1984, a Record of Decision was signed which approved an initial remedial measure (IRM) for an alternate water supply to replace the contaminated municipal well. The selected IRM consisted of a Lake Michigan water intake structure and a water filtration/flocculation treatment plant.

The selected remedial action involves natural attenuation of the TCE and PCE plumes to Lake Michigan. The aquifer would be restored to safe levels for consumption after 50 years. During the 50-year purging period, institutional restrictions on the installation of private wells in the contaminated aquifer will be enforced by local health officials. In addition, long-term monitoring of the plumes will continue. The estimated annual O&M costs for monitoring are $17,000.

PERFORMANCE STANDARDS OR GOALS: The concentrations of TCE and PCE expected in the nearshore surface waters of Lake Michigan as a result of the continued release of the contaminant plumes under natural flow conditions are 0.008 ppb and 0.01 ppb, respectively.

INSTITUTIONAL CONTROLS: Institutional restrictions on the installation of private wells in the contaminated aquifer will be enforced by local health officials.

COMMENTS: N/A

KEYWORDS: Ground Water; Institutional Controls; O&M; Tetrachloroethlylene (PCE); Trichloroethylene (TCE); VOCs.

CHEM-DYNE, OH (EDD)
July 5, 1985

ROD ABSTRACT

The Chem-Dyne site is located within the limits of the City of Hamilton, Butler County, Ohio which had an estimated 1980 population of 66,400. The site covers approximately 10 acres of land, and lies within the bedrock aquifer of the Great Miami River. The Chem-Dyne site probably began receiving hazardous substances as early as 1974. Additionally, Spray-Dyne, one of the numerous Chem-Dyne "affiliated companies", produced antifreeze onsite by recycling chemical wastes and by using virgin chemicals. By 1976, Chem-Dyne was a rapidly growing corporation storing, "recycling", and disposing of almost every type of industrial chemical waste. Operations of Chem-Dyne resulted in uncontrolled releases of hazardous materials. In five years of operation the facility accepted waste from approximately 200 generators. The materials handled included pesticides and pesticide residues, chlorinated hydrocarbons, solvents, waste oils, plastics and resins, PBB, PCBs, TRIS, acids and caustics, heavy metal and cyanide sludges, and packaged laboratory chemicals. More than 30,000 drums and 300,000 gallons of bulk materials were left onsite when the operation closed in February 1980.

The selected remedial action includes: installation of a ground water extraction system with subsequent treatment of the contaminated water (air emissions from the treatment system shall be treated by carbon adsorption); demolition of onsite buildings; removal of selected soil; and installation of a site cap. Total capital cost for the selected remedial alternative is estimated to be $11,600,000 and O&M costs are estimated to be $597,000 per year.

PERFORMANCE STANDARDS OF GOALS: Ground water will be treated to less than 100 ppb total VOCs so that compliance well samples meet background levels or a cancer risk level of 10^{-6}.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Offsite Disposal -- Wastes will be disposed of offsite at an EPA-approved facility. The ROD did not specify whether the disposal facility has a double or single liner.

KEYWORDS: Acids; Air; Arsenic; Capping; Excavation; Ground Water; Ground Water Treatment; O&M; Offsite Disposal; Organics; PCBs; Pesticides; Soil; Surface Water.

CROSS BROTHERS, IL (IRM)
March 25, 1985

ROD ABSTRACT

The Cross Brothers' uncontrolled hazardous waste site is located approximately 14 miles east of the City of Kankakee, Illinois, within Pembroke Township of Kankakee County. The site consists of a 20-acre parcel of land surrounded primarily by low density single family housing. Abner and James Cross operated a drum and pail reclaiming operation at the site from 1961 until 1980. The operation employed a crude process to incinerate the residue material that was contained in nearly all of the drums and pails received for reconditioning. Essentially, the operation consisted of inverting the containers to allow the residue materials to drain out onto the ground. Then solvent would be added to the containers to dissolve any remaining residue. Throughout the container reclamation process, the Cross Brothers' operation was extremely haphazard, allowing the indiscriminant dumping of great quantities of residues (largely dyes, paints, inks and solvents).

The selected remedial action includes offsite disposal of surficial and buried waste materials and visibly contaminated soil. Total capital cost of the selected remedial alternative is estimated to be $377,728.

PERFORMANCE STANDARDS OR GOALS: The goal for this initial remedial measure is to remove drums, containers and visibly contaminated soil. No specific cleanup levels have been defined at this time for contaminated soil and ground water.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Offsite Disposal -- Offsite disposal criteria were not defined in the ROD.

KEYWORDS: Excavation; Offsite Disposal; Soil; Solvents.

EAU CLAIRE, WI (IRM)

June 10, 1985

ROD ABSTRACT

The Eau Claire Municipal Well Field consists of a 500-acre site located in the northwest corner of the City of Eau Claire, Wisconsin. The Eau Claire municipal well system supplies drinking water to approximately 57,500 residents and to numerous commercial and industrial establishments in the City of Eau Claire and the Town of Washington. In March 1981, as part of the U.S. Environmental Protection Agency Ground Water Supply Survey, the Wisconsin Department of Natural Resources (WDNR) tested the Eau Claire municipal water supply for volatile organic compounds. The following organic compounds were identified in the municipal water supply: 1,1-dichloroethene, 1,1-dichloroethane, 1,1,1-trichloroethane, and trichloroethene.

The selected remedial action includes construction of air stripping facilities to remove volatile organic compounds from the contaminated flow (11.2 million gallons per day (mgd)) from the north well field. The treated water will be discharged into the municipal water treatment plant and distribution system. Total capital cost for the selected remedial alternative is esti- mated to be $1,420,000 with O&M costs estimated to be $195,000 per year.

PERFORMANCE STANDARDS OR GOALS: The performance goal for the aeration treatment system is to achieve a 99.6% removal of the critical contaminant 1,1-dichloroethene from the municipal water supply. Two other compounds identified at the site are also suspected human carcinogens (trichloroethene and tetrachloroethene). The Safe Drinking Water Act establishes Recommended Maximum Concentration Levels (RCMLs) for non-threshold toxicants, such as carcinogens, to be zero.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air Stripping; Alternate Water Supply; Ground Water; O&M; Organics.

KUMMER LANDFILL, MN
June 12, 1985

ROD ABSTRACT

The Kummer Sanitary Landfill occupies approximately 40 acres in the southern portion of Northern Township, Beltrami County, Minnesota. The site was operated as a solid waste facility from 1971 until October 1, 1984. During the period of operations, municipal refuse, demolitation debris, and industrial waste were accepted at the site. However, the disposal of hazardous wastes was never documented at any time during operations. The landfill is situated above a shallow surficial sand aquifer which serves numerous downgradient private wells east and southeast of the landfill. At present, the Kummer Sanitary Landfill appears to be the major source of volatile organic contamination found in private drinking water wells in the area.

The selected remedial action includes provisions for an alternate water supply. These provisions consist of constructing two wells in a deep uncontaminated aquifer, a water tower and distribution system. Total capital cost for the selected remedial alternative is estimated to be $1,624,850 with O&M costs estimated to be $28,440 per year.

PERFORMANCE STANDARDS OR GOALS: To reduce the public cancer health threat to less than 10^{-6} by providing a safe and reliable alternate water supply.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Alternate Water Supply; Ground Water; O&M; Organics.

LEHILLIER/MANKATO, MN

September 27, 1985

ROD ABSTRACT

The LeHillier/Mankato site is located in south-central Minnesota approximately 80 miles southwest of Minneapolis-St. Paul, adjacent to the City of Mankato. The LeHillier area contained numerous natural and manmade depressions resulting from changes in the channels of the Minnesota and Blue Earth Rivers, and from excavation of sand and gravel. Between 1925 and 1960, these depressions were filled with miscellaneous rubbish. No records of the dumping activities or types of waste materials were kept. In the fall of 1981, the Minnesota Pollution Control Agency (MPCA) received information alleging that hazardous wastes had been disposed of at several dumps or fill areas in LeHillier. A followup investigation confirmed the existence of these disposal areas and contamination of the shallow sand and gravel aquifer with volatile halogenated hydrocarbons, primarily trichloroethylene (TCE). However, the source of TCE was not identified.

The selected remedial action for this site includes: extraction, with partial treatment by air stripping, of the contaminated ground water plume through adaptation of eight existing U.S. Army Corps of Engineers (COE) ground water and flood control wells and construction of two new extraction wells; extension of the LeHillier community water system to affected residents and businesses not currently serviced; and proper abandonment, in accordance with State well codes, of individual wells formerly used as drinking water supplies. This action will manage contaminant migration until contaminant levels reach drinking water quality. Total capital cost for the selected remedial action is estimated to be $800,000 with first year operation and maintenance costs of $70,000. The State of Minnesota will continue O&M for the remaining duration which should not exceed 9 years.

PERFORMANCE STANDARDS OR GOALS: Extraction and treatment of the TCE plume to less than the 10^{-6} excess lifetime cancer risk concentration of 2.8 ug/l, which is considered acceptable for public use. The time to achieve acceptable concentrations in the aquifer has been estimated at 5 to 10 years.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air Stripping; Ground Water; Ground Water Treatment; Trichloroethylene (TCE).

MAIN STREET, IN
August 2, 1985

ROD ABSTRACT

The City of Elkhart is located in north central Indiana in Elkhart County. Three well fields supply drinking water to approximately 37,000 of the city's residents. Main Street Well Field is the largest of the three well fields consisting of 15 wells and supplies 70-80 percent of the city's water needs. In April 1981 during an U.S. EPA Ground Water System Survey, volatile organic compounds were detected in water furnished from Main Street Well Field. The compounds detected included trichloroethylene (TCE), 1,2-dichloroethylene, 1,1,1-trichloroethane and 1,1-dichloroethane. Concentrations of contaminants ranged from 2.0 ppb of 1,1-dichloroethane to 94 ppb of TCE.

The selected remedial action includes construction of air stripping facilities to remove volatile organic compounds from the contaminated flow of the Main Street Well Field. The treated water will be discharged to the existing water treatment plant and distribution system. Total capital cost of the selected remedial alternative is estimated to be $1,106,000 with O&M costs estimated to be $158,000 per year.

PERFORMANCE STANDARDS OR GOALS: The air stripping treatment system is designed to achieve a 99.1% removal of TCE, the contaminant found in highest concentration; 88.9% removal of PCE; and 96.7% removal of 1,1-dichloroethylene.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air Stripping; Ground Water; Organics; Soil; Tetrachloroethylene (PCE); Trichloroethylene (TCE).

MORRIS ARSENIC, MN

August 7, 1985

ROD ABSTRACT

The Morris Arsenic site is located in Stevens County, approximately one mile northeast of Morris, Minnesota. In the early 1940s, approximately 1,500 pounds of arsenic-laced grasshopper bait was reportedly buried in a gravel pit near the intersection of Highways 28 and 59. The subsequent construction of the Highway 59 Bypass through the general location of the burial site has made the discovery of the exact burial location difficult. It has been presumed that the arsenic was mechanically dispersed during highway construction since top soil cleared from the site for road bed preparation was later spread along the side slopes.

The site poses no imminent health hazard to the public due to the fact that migration of arsenic in the ground water does not appear to be occurring at the site and contaminant levels found in the ground water were similar to the expected natural background concentration. In addition, levels of arsenic found in the soils at the site are within the range of natural levels of arsenic in soil. Therefore, since the site poses no significant threat to public health, welfare or the environment, the "no-action" alternative was selected.

PERFORMANCE STANDARDS OR GOALS: N/A

INSTITUTIONAL CONTROLS: EPA has recommended to State, County, and local officials that a deed notice be placed on the property noting previous use of the site for the disposal of a hazardous substance.

COMMENTS: N/A

KEYWORDS: Arsenic; Deed Restriction; Ground Water; No Action; Soil.

NEW LYME, OH
September 27, 1985

ROD ABSTRACT

The New Lyme Landfill is located near State Route 11 on Dodgeville Road in Ashtabula County, approximately 20 miles south of the City of Ashtabula, Ohio. The landfill occupies about 40 acres of a 100-acre tract. Operations began at the site in 1969, and were initially managed by two farmers. In 1971, the landfill was licensed by the State of Ohio and operations were taken over by a licensed landfill operator. According to documentation, the New Lyme Landfill received household, industrial, commercial, and institu- tional wastes and construction and demolition debris. However, numerous violations of the license occurred, including: open dumping; improper spreading and compacting of wastes; no State approval for disposal of cer- tain industrial wastes; and excavation of trenches into the shale bedrock. In August 1978, the landfill was closed by the Ashtabula County Health De- partment. Documents indicate that wastes at the New Lyme Landfill site in- cluded: coal tar and coal tar distillates, asbestos, resins and resin tar, paint and paint sludge, oils, lacquer thinner, peroxide, corrosive liquids, acetone, xylene, toluene, kerosene, naptha, benzene, linseed oil, mineral oil, fuel oil, chlorinated solvents, 2,4-D, and laboratory chemicals.

The selected remedial action for this site includes: construction of a RCRA cap over the landfill; installation of extraction/containment wells around the perimeter of the landfill to dewater the landfill and to eliminate leachate production; onsite treatment of contaminated ground water and leachate using biological disc, sodium hydroxide precipitation and granular activated carbon; onsite consolidation of contaminated sediment; installation of gas vents; fencing of the site and installation of a ground water monitoring system. Total capital cost for the selected remedial action is estimated to be $10,798,000 with annual O&M costs of $252,000 for the duration that water treatment is necessary. After that time, the annual O&M costs are estimated to decrease to $44,000.

PERFORMANCE STANDARDS OR GOALS: Implementation of the selected remedial action will eliminate the exposure pathways of direct contact with leachate seeps, ingestion and inhalation of soil, and exposure to ground water.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Consolidation -- Contaminated sediment will be moved onsite and consolidated under the RCRA cap.

KEYWORDS: Asbestos; Capping; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Ground Water Treatment; Leachate Collection/Treatment; Oils; Onsite Containment; Sediments; Sludge; Soil; Solvents; Toluene; Venting; VOCs.

NORTHERNAIRE, MI
September 11, 1985

ROD ABSTRACT

Northernaire Plating is the site of a former electroplating facility located at 1002 Sixth Street in Cadillac, Wexford County, Michigan. Electroplating operations were conducted at the 12.75-acre site from 1971 to 1981. Waste contaminants from electroplating commonly include copper, nickel, chromium, zinc, lead, tin and cadmium, as well as metal complexing agents. In 1978, two domestic wells were found to be contaminated with hexavalent chromium. In addition, process waste waters containing cadmium and chromium were discharged into the municipal sewer system. A private sewer line permitted exfiltration of these waste waters through poorly sealed joints. A drywell in the sewer line at the facility allowed plant effluent to be discharged directly to the highly permeable unsaturated soil.

This ROD is a source control remedial action that includes: excavation of soil and sewer line sediments to meet response objectives of 50 mg/kg chromium and 10 mg/kg cadmium, excavation and replacement of the sewer line, and disposal offsite at a RCRA facility; cleaning the facility's floor of dust and residue; breaking up a 30ft. X 10ft. area of the concrete floor and the drywell in the building, sampling the soil under the building for cadmium and chromium, and excavation and disposal offsite at a RCRA facility, if necessary; and backfilling with uncontaminated soil. Any additional remedial actions will be addressed in a separate Record of Decision upon completion of the RI/FS. Total capital cost for the selected remedial action is estimated to be $75,000.

PERFORMANCE STANDARDS OR GOALS: Excavation of soils and sewer line sediments to meet response objectives of 50 mg/kg chromium and 10 mg/kg cadmium.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Offsite Disposal -- Soil and sewer line sediments will be transported to a privately-owned offsite RCRA Subtitle C facility.

KEYWORDS: Cadmium; Chromium; Excavation; Ground Water; Offsite Disposal; Sediments; Soil.

OLD MILL, OH
August 7, 1985

ROD ABSTRACT

The Old Mill site is in the Village of Rock Creek, Ashtabula County, Ohio. The site consists of two parcels of land; the Henfield property and the Kraus property. Land use in the vicinity of the site is represented by a mixture of residential, agricultural, and commercial/industrial developments. The Henfield property is approximately three acres, and includes four dilapidated wood buildings and four concrete silos. The Kraus property is approximately ten acres, partially covered with piles of railroad ballast, and has one empty abandoned bulk liquid tank. In 1979, the U.S. EPA and Ohio EPA found approximately 1,200 drums of toxic waste, including solvents, oils, resins and PCBs, stored on both the Henfield and Kraus properties. Superfund emergency removal activities and enforcement actions resulted in a removal action that began in November 1981 and was completed by October 1982. Today, contaminated soil and ground water remain onsite.

The selected remedial action includes: removal and offsite disposal of a select volume of contaminated soil; extraction and treatment of contaminated ground water; implementation of aquifer use restrictions; and provisions for an alternate water supply. Total capital cost for the selected remedial alternative is estimated to be $3,917,000 with O&M costs approximately $45,000 per year. Since publication of the ROD, the cost estimate has increased to $5,100,000, reflecting an additional $1000y^3$ of soil that was not accounted for in the ROD.

PERFORMANCE STANDARDS OR GOALS: A ground water cleanup level of 10^{-5} cancer risk level has been proposed. Soils contaminated with base/neutral compounds will be removed to background levels and soils contaminated with VOCs will be removed to a cancer risk level of 10^{-6}.

INSTITUTIONAL CONTROLS: Aquifer use restrictions will be implemented until aquifer contamination falls below a 10^{-6} cancer risk level. Land use restrictions are required to protect the ground water monitoring and treatment system.

COMMENTS: Offsite Disposal -- Wastes, contaminated soil and building debris will be disposed of offsite in a RCRA-approved landfill. Non-contaminated building debris will be disposed in a sanitary landfill.

KEYWORDS: ACL; Alternate Water Supply; Aquifer Use Restrictions; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; O&M; Offsite Disposal; Oils; Organics; PCBs; River/Stream Sediments; Soil; Solvents; Surface Water.

SCHMALZ DUMP, WI
August 13, 1985

ROD ABSTRACT

The Schmalz Dump site is located in the Town of Harrison, Wisconsin, on the north shore of Lake Winnebago. The site occupies approximately five acres of wetland in the federally designated Waverly Beach Wetlands area. According to the Wisconsin Department of Natural Resources and court documents, industries dumped wastes at various locations along the north shore of Lake Winnebago for several years. Mr. Gerald Schmalz, site owner, began filling his property in 1968. Records show that the wastes hauled there consisted of car bodies, stone, water tanks, trees, pulp chips and mash. Between 1972 and 1973, the site accepted fly ash and bottom ash from a local utility, and in 1978 and 1979 Mr. Schmalz accepted the demolition debris from a building owned by Allis-Chalmers Corporation.

The selected remedial action includes excavation and offsite disposal of 3,500 cubic yards of contaminated building debris and sediments. Total capital cost for the selected remedial alternative is estimated to be $2,088,300, with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: Removal of all contaminated debris and one foot of underlying sediment. PCBs will be removed in the dewatering process to below 0.5 ppb.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Chromium; Excavation; Heavy Metals; Offsite Disposal; PCBs; Sediments; Soil; Wetlands.

VERONA WELL FIELD, MI
(Second Remedial Action)
August 12, 1985

ROD ABSTRACT

The Verona Well Field is located approximately 1/2 mile northeast of Battle Creek, Calhoun County, Michigan. The well field consists of three wells west of Battle Creek River and 27 wells, with a major pumping/water treatment station, east of the river. The Verona Well Field provides potable water to 35,000 residents of Battle Creek, and part or all of the water supply requirements for two major food processing industries and a variety of other commercial and industrial establishments. In 1981, county health officials discovered that water from the Verona Well Field was contaminated with volatile chlorinated hydrocarbons. The Michigan Department of Natural Resources investigated potential sources of the contamination, and identified the Thomas Solvent Company facilities, the Grand Truck Rail Road marshaling yard, and the Raymond Road Landfill as possible sources of the volatile hydrocarbons.

An IRM was signed in May 1984 that provided for the installation of interceptor wells and air stripping to prevent further deterioration of the well field. This second remedial action is a source control measure that includes construction of a ground water extraction well system to contain and collect contaminated ground water in the vicinity of the Thomas Solvent Company's Raymond Road facility. Contaminated ground water will be pumped to the existing Verona Well Field air stripper for treatment. In addition, air extraction wells will be installed to enhance the volatilization of the VOCs from the contaminated soils. The next operable unit will address source control at the Thomas Solvent Annex and the Grand Truck marshaling yard. Total capital cost for the selected remedial alternative is estimated to be $1,660,000 with O&M costs approximately $90,000 for the first 2 years and $46,000 for each year thereafter.

PERFORMANCE STANDARDS OR GOALS: The objective of the selected remedial action is to treat the contaminants in the soil on the Raymond Road property, and to minimize migration of the highly contaminated ground water surrounding the site. The soil cleanup levels are not specified in the ROD, however, it is estimated that within three years, the ground water concentration will decrease to 100 ppb volatile organic compounds.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Air Stripping; Ground Water; Ground Water Treatment; Soil; Solvents; Tetrachloroethylene (PCE); Toluene; Trichloroethylene (TCE); VOCs.

WAUCONDA SAND AND GRAVEL, IL

September 30, 1985

ROD ABSTRACT

The Wauconda Sand and Gravel Landfill site is located in Lake County, Illinois, approximately two miles north of the Village of Wauconda. The 74-acre site is comprised of a 43-acre unpermitted landfill and a nine-acre permitted landfill. Before 1950, the site property was used as a sand and gravel pit. From 1950 until 1977, Wauconda Sand and Gravel Company operated the northern portion (43-acre unpermitted fill) of the site as a landfill. Landfill operations during this period consisted of dumping refuse into the mined-out gravel pit. The refuse deposited at the landfill consisted of residential garbage, construction debris, and industrial sludges and drums with undetermined contents. In 1980, a private well adjacent to the eastern boundary of the landfill was sampled by the Illinois Environmental Protection Agency and inorganic, organic and PCB contamination was detected. Initial remedial investigations concluded that low levels of metals and organics were contaminating the ground water and surface water (Mutton Creek).

The selected remedial action for this site includes: installation of leachate collection drains to stop surface leachate discharge into Mutton Creek; providing for proper disposal of leachate (either at the Wauconda Sewage Treatment Plant, or a hazardous waste treatment facility in accordance with Agency policy); regrading settled, depressed and eroded areas on the existing landfill soil cover with sufficient slope to promote rain runoff; revegetating bare and eroded areas to prevent erosion of soils into Mutton Creek; and fencing. This operable unit only addresses leachate discharge to Mutton Creek; ground water decisions are being deferred until additional RI/FS work is completed. Total capital cost of the selected remedial alternative is estimated to be $1.6 million with annual O&M costs of approximately $50,000 for a 30-year period.

PERFORMANCE STANDARDS OR GOALS: The main objective of the selected remedial action is to eliminate the discharge of contaminated leachate to Mutton Creek and further erosion of contaminated soils.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Ground Water; Heavy Metals; Inorganics; Leachate Collection/Treatment; O&M; Offsite Disposal; Organics; Soil; Surface Water.

BAYOU BONFOUCA, LA
August 15, 1985

RCD ABSTRACT

The Bayou Bonfouca site, a 55-acre abandoned creosote works facility, is located off of West Hall Avenue and Bayou Lane in Slidell, Louisiana. The site is a flat, mostly overgrown parcel and is located primarily within a designated 100-year floodplain. The earliest records of the Bayou Bonfouca site date back to 1904. The creosote plant treated pilings for use in the construction of a railway across Lake Ponchartrain. Over the years, the plant operated under the ownership of various creosote companies, with the last property owner being the Braselman Corporation. Onsite creosote waste deposits have contaminated the floor of the bayou, two drainage pathways through the site, an adjacent creek bottom, on- and offsite soil and upper ground water zones.

The selected remedial action for this site includes: excavation, transportation and disposal at a RCRA landfill facility of creosote waste and the highly contaminated soil beneath the creosote piles and debris; and transportation and disposal of contaminated water by deep-well injection at an approved RCRA facility. Additional investigations will be undertaken to examine the contaminated drainage pathways, ground water zones, and bayou sediment. These areas will be addressed in a second remedial action. Total capital cost for the selected remedial alternative is estimated to be $903,000, with no O&M requirements.

PERFORMANCE STANDARDS OR GOALS: Source control.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: N/A

KEYWORDS: Deferred Decision; Excavation; Floodplain; Ground Water; Offsite Disposal; Sediments; Soil.

MOTCO, TX
March 15, 1985

ROD ABSTRACT

The MOTCO site is located about 2 miles southeast of the City of LaMarque, Texas and occupies approximately 11.3 acres near the junction of State Highway 3 and the Gulf Freeway. The site has been used for recycling styrene tars and disposal of industrial chemical wastes. Due to numerous complaints, the City of LaMarque passed an ordinance prohibiting disposal of liquid wastes in surface impoundments which forced the owners to close the site. Subsequent owners attempted to recycle the wastes in the lagoons but later abandoned the project. The results of the RI indicate that there is contamination of the shallow ground water and subsurface soils with particularly high levels of organic contamination. The onsite lagoons contain stratified wastes which contain PCBs.

The cost-effective remedial alternative selected for this site involves transporting surface water in the impoundments by pipeline to an industrial waste water treatment plant, incineration of non-PCB liquid organics at an approved RCRA facility, incineration of PCB liquids and organics at an approved TSCA facility, and offsite disposal of the tars/sludges and soils at a RCRA (double lined) facilty. The option to incinerate material onsite was retained due to possible cost escalation of offsite incineration. The estimated total cost for this alternative is $42,300,000.

PERFORMANCE STANDARDS OR GOALS: Source control.

INSTITUTIONAL CONTROLS: Not specified.

COMMENTS: Offsite Disposal -- The requirement for a double lined landfill facility is estimated to increase the cost between 7 and 17 percent (depending on which incineration option is implemented).

KEYWORDS: Alternative Technology; Excavation; Floodplain; Ground Water; Heavy Metals; Incineration; Inorganics; Offsite Disposal; Organics; PCBs; Sludge; Soil; Surface Water.

SOUTH VALLEY, NM (IRM)
March 22, 1985

ROD ABSTRACT

The South Valley site is located mostly in the inner valley of Albuquerque, New Mexico. Industrial development in South Valley began in the 1950s with metal parts manufacturing. By the 1960s, organic chemicals were being handled in the area. Presently, petroleum fuels and various other organic chemicals are stored and handled within the area. South Valley has been designated as the State's highest priority site for cleanup due to the presence of potentially high concentrations of hazardous substances in the ground water near the City of Albuquerque's well field.

The selected initial remedial action includes installing a new water supply well to replace the capacity of the contaminated well, San Jose No. 6. Total capital cost for the selected remedial alternative is estimated to be $775,000 with O&M costs approximately $12,000 per year.

PERFORMANCE STANDARDS OR GOALS: 10^{-6} Lifetime Excess Cancer Risk Concentrations for 1,1-dichloroethene 0.25 ug/l; trichloroethene 2.8 ug/l; tetrachloroethene 0.9 ug/l.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Alternate Water Supply; Drinking Water Contaminants; Drinking Water Standards; Ground Water; Organics.

TRIANGLE CHEMICAL, TX
June 11, 1985

ROD ABSTRACT

The Triangle Chemical Company site is a 2.3-acre tract located on Texas State Highway 87, just north of the Bridge City, Texas City limits. The Triangle Chemical Company operated a chemical mixing and blending facility from the early 1970s until 1981. During the company's operating period, various types of industrial cleaning compounds, automobile brake fluid, windshield washer solvents, hand cleaners, and pesticides were produced. Raw materials and finished products were stored onsite in bulk surface storage tanks and 55-gallon drums. Currently, approximately 51,000 gallons of hazardous materials are stored in 12 above-ground storage tanks. The results of the RI indicate that onsite soil contamination is extensive for volatile organic compounds; however, ground and surface water in the vicinity of the site are not significantly impacted.

The selected remedial action for this site includes: incineration and deep well injection of the tank and drum contents; decontamination of all onsite structures; offsite disposal of trash and debris; and mechanical aeration of contaminated soils to background levels. Total capital costs for the selected remedial alternative is estimated to be $385,000 with O&M costs approximately $500 per year.

PERFORMANCE STANDARDS OR GOALS: Cleanup of contaminated soils to background levels.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Alternative Technology; Background Levels; Floodplain; Incineration; Organics; Soil; Toluene.

ELLISVILLE, MO
July 10, 1985

ROD ABSTRACT

The Ellisville Area site is located in St. Louis County, Missouri, about twenty miles west of downtown St. Louis. The site is comprised of three non-contiguous properties: the Rosalie Investment Company property, the Callahan property and the Bliss and contiguous properties. Containerized and bulk liquid and solid wastes were reportedly disposed of on these properties during the 1970s. The types of wastes include solvents, oils, sludges, pesticides, and flammable gelatenous materials. Dioxin contamination has been detected at the Bliss portion of the site.

The selected remedial action includes the:

- Callahan Property. Stabilize and control erosion of the fill area; remove and dispose the plastic cover over the fill area and the cover's hold-down blocks; remove and salvage the barbed-wire and chain-link fences around the site; and remove the gravel in the two drum storage areas. A preliminary cost estimate for the remedial action is $12,000.
- Rosalie Property. Soil excavation; offsite disposal of contaminated soil, buried drums, cans and other debris; and soil testing and analysis. A preliminary cost estimate for the remedial action is $52,000.
- Bliss Property. U.S. EPA is currently working on an expanded feasibility study for this site, since additional cleanup options should be evaluated for the dioxin contaminated soil.

PERFORMANCE STANDARDS OR GOALS: Removal of contaminated soil to a depth which will result in contaminant levels that do not pose a public health threat at the Rosalie property.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Dioxin; Excavation; Inorganics; Offsite Disposal; Organics; Pesticides; Sludge; Soil; Solvents; Toluene.

MILLTOWN, MT
(Supplemental ROD)
August 7, 1985

ROD ABSTRACT

The Milltown Reservoir Sediments site is located in Missoula County, Montana. The site is adjacent to the Milltown Dam where the Big Blackfoot River joins the Clark Fork River. Constructed in 1906, this hydroelectric dam formed a reservoir that trapped sediments from mining, milling and smelting operations in the upper Clark Fork valley. During the years since construction, the reservoir storage has been almost totally filled with arsenic contaminated sediments. In May 1981, Milltown's four community water supply wells were found to be contaminated with arsenic and other heavy metals. The highest arsenic levels measured have been between 0.54 to 0.90 milligrams per liter (mg/l).

The original ROD was signed in April 1984 approving the installation of an alternate water supply, and the flushing of the plumbing system of each house to remove suspended materials from the water system. This supplemental ROD approves the replacement of household water supply appurtenances and on-going sampling of residential water systems to fulfill the intent of the original ROD.

PERFORMANCE STANDARDS OR GOALS: EPA drinking water standard for arsenic of 0.050 mg/l.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Supplemental ROD -- Replacement of household water supply appurtenances and continued sampling of individual residences are necessary to ensure that the public is not exposed to excessive levels of arsenic and heavy metals.

KEYWORDS: Arsenic; Ground Water; Heavy Metals; Internal Plumbing; Soil.

WOODBURY CHEMICAL, CO
July 19, 1985

ROD ABSTRACT

Woodbury Chemical Company operated a pesticide manufacturing facility at 54th Avenue and Jackson in heavily industrialized Commerce City, Colorado, from the late 1950s until 1965 when the facility was destroyed by fire. Fire rubble and debris contaminated with approximately 1,565 pounds of organochloride pesticides were disposed on an adjacent empty lot which is the designated CERCLA site. Results of the remedial investigation show contaminated soils and sediments onsite, contaminated sediments offsite, and trace levels of dieldrin in the ground water; however, significant contamination is limited to the rubble piles. In addition, several separate investigations conducted between October 1976 and June 1985 indicated three general types of contaminants: pesticides, metals, and other organic compounds. However, only the pesticides are considered to be directly attributable to the site with the other contaminants attributable to low level area wide ground water contamination.

The cost-effective remedial action for this site includes: excavation and offsite transport, incineration, and ash disposal of highly contaminated rubble (total pesticide concentration in excess of 100 ppm) at an EPA approved incineration/disposal facility; excavation and offsite disposal of contaminated soils, to a cleanup level of 3 ppm total pesticide concentration, at an EPA approved facility; backfilling with clean soil, regrading and revegetating the site; and ground water monitoring and site maintenance for a three-year period. Total capital cost for the selected remedial alternative is estimated to be $2,450,000. A three-year O&M period for the site is estimated to be $21,000.

PERFORMANCE STANDARDS OR GOALS: Cleanup of contaminated soils to 3 ppm and contaminated rubble to 100 ppm total pesticide concentration. A soil cleanup level of 3 ppm was selected based on residual soil pesticide levels in urban environments and modeling of contaminant migration to ground water to identify an acceptable risk level at the site boundary.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Incineration/Offsite Disposal -- Although the selected offsite remedy exceeded the cost of an onsite RCRA landfill by 60 percent (i.e., $930,000), the additional cost was justified by greater long term ground water protection in an area with potential ground water fluctuations. In addition, the selected remedy does not require long-term monitoring and will result in the destruction of over 70% of the pesticide contaminants.

KEYWORDS: Excavation; Incineration; Offsite Disposal; Organics; Pesticides; Soil.

CELTOR CHEMICAL WORKS, CA
(Second Remedial Action)
September 30, 1985

ROD ABSTRACT

The Celtor Chemical Works site consists of approximately 2.5 acres, and is located in the northern end of the Hoopa Valley in Humboldt County, CA. The Hoopa Valley Indian Tribe is the owner of the Celtor site. The Tribe leased the land in 1958 to the Celtor Chemical Corporation which processed sulfide ore for copper, zinc and precious metal extraction. In June 1962, the company was delinquent in its royalty payments to the Hoopa Valley Indian Tribe and subsequently abandoned the site. Mine tailings generated from the milling operations were left onsite. These tailings, along with nonspecific releases of processed ore, are believed to be the cause of the acidic surface waste runoff and elevated metals concentrations in the soils throughout the site. In addition the tailings may have caused numerous fish kills for which the California Department of Fish and Game cited the Celtor Chemical Corporation.

Initial remedial actions were implemented at the site in October 1983, and included excavation and offsite disposal of all visibly contaminated material. This material included all tailings, non-concrete structures, and a portion of the pasture adjacent to the site. The selected alternative for the second remedial action includes excavation and offsite disposal of all soils contaminated above site-specific action levels at a RCRA-approved hazardous waste disposal facility. Total capital cost is estimated to be $3,065,338 and O&M costs are estimated to be $7,000 for an initial one-year period of grounds maintenance.

PERFORMANCE STANDARDS OR GOALS: Action levels for soil contaminants were based on acceptable EPA National Ambient Water Quality Criteria and are as follows: arsenic, 100mg/kg; cadmium, 25 mg/kg; copper, 2,500 mg/kg; lead, 500 mg/kg; zinc, 5,000 mg/kg. Action levels for surface and ground water were also defined based on MCLs or DWRs as promulgated under the Safe Drinking Water Act, and for the Trinity River based on EPA standards for protection of aquatic life. However, surface and ground waters will not be addressed at Celtor, as excavation and removal of waste soils is expected to adequately protect human health and the environment.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: N/A

KEYWORDS: Arsenic; Excavation; Flood Plain; Heavy Metals; Offsite Disposal; Soil; Surface Water.

DEL NORTE, CA
September 30, 1985

ROD ABSTRACT

The Del Norte County Pesticide Storage Area site, located approximately one mile northwest of Crescent City, CA consists of less than one acre of land contaminated with a variety of herbicides, pesticides, and volatile and semi-volatile organic compounds. Interim and emergency storage activities that occurred during site operations from 1970 to 1981 have resulted in on-site soil and ground water contamination. Available documentation about actual day-to-day site operations is inadequate. However, site investigations revealed that a sump, approximately 15 feet by 20 feet, is the primary area of soil contamination, with organic compounds detected to a depth of approximatey 15 feet below grade. It is suspected that wastes and/or rinse water were disposed of in the sump. Primary contaminants detected in both soil and ground water are 2,4-D and 1,2-dichloropropane.

The selected remedial action for the site includes: excavation and off-site disposal of approximately 700 cubic yards of soils from the sump and trench areas to a RCRA-approved facility; extraction of contaminated ground water; carbon adsorption treatment of ground water contaminated by organics and pesticides; offsite disposal of spent carbon filters to a RCRA-approved facility; treatment of chromium contaminated ground water by coagulation and sand filtration technologies; offsite disposal of chromium-rich waste brine to a RCRA-approved facility; piping treated ground water to the county sewer main; and ground water monitoring in accordance with RCRA Part 264. Total capital cost is estimated to be $1.24 million with no O&M requirements.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for three priority pollutants were defined in the ROD: 1,2-dichloropropane, 10 ppb, based on an excess cancer risk of 10^{-6}; 2,4-D, 100 ppb, based on EPA Maximum Contaminant Levels (MCLs); total chromium, 50 ppb, based on MCLs.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Offsite Disposal -- Wastes will be disposed of at a RCRA-approved Class I offsite disposal facility.

KEYWORDS: Chromium; Excavation; Ground Water; Ground Water Strategy; Ground Water Treatment; Offsite Disposal; Organics; Pesticides; Publicly Owned Treatment Works (POTW); RCRA Part 264; Soil.

JIBBOOM JUNKYARD, CA
May 9, 1985

ROD ABSTRACT

The Jibboom Junkyard site is located on the east bank of the Sacramento River, approximately 6,000 feet from the State Capitol Building. The nine-acre site is the former location of the Associated Metals Company salvage yard. Today, a majority of the site, 6.7 acres, is covered by Interstate 5 and the adjacent Jibboom Street. The property was used for a metal salvage operation until 1965. All grades of metal were salvaged, along with railroad cars, army tanks, batteries, and some transformers. Results of seven EPA and DOHS sampling efforts indicate that there is extensive lead, zinc, and copper contamination onsite. Most of the contamination is limited to the top one foot of soil, and no offsite contamination has been detected. Subsurface contamination above background levels was only detected at four locations.

The selected remedy for the Jibboom Junkyard consists of excavation and removal of contaminated soils to a RCRA-approved offsite Class I hazardous waste disposal facility. The total capital cost of the selected remedial alternative is estimated to be $1,460,000, with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: The performance standard outlined in the ROD is excavation of all contaminated soils containing lead above 500 ppm.

INSTITUTIONAL CONTROLS: N/A

COMMENTS: Offsite Disposal -- Waste will be disposed of offsite in a RCRA-approved offsite Class I landfill.

KEYWORDS: Excavation; Heavy Metals; Offsite Disposal; PCBs; Soil.

PONDERS CORNER, WA
(Second Remedial Action)
September 30, 1985

ROD ABSTRACT

Ponders Corner, or the Lakewood site as it is identified in the National Priorities List, is located in Pierce County, Washington, south of the City of Tacoma. In July 1981, EPA sampled drinking water wells in the Tacoma, WA area for contamination with purgeable halocarbons. The sampling showed that Lakewood Wells H1 and H2 were contaminated with 1,2-dichloroethylene (1,2-DCE), trichloroethylene (TCE), and tetrachloroethylene (PCE). In mid-August 1981 Lakewood water district took wells H1 and H2 out of production.

It was determined that the septic tanks and the ground disposal area of a commercial cleaners were the probable source of well water contamination. Solvents used in the dry cleaning process were disposed in the septic tank, and liquid wastes consisting of solvent-contaminated sludges and water draw-off were disposed on the ground outside the cleaners. Initial Remedial Measures (IRMs) implemented in June 1984 at the site included the construction of air stripping towers for wells H1 and H2. The recommended alternative for this second remedial action includes: operation of the H1-H2 treatment system to continue cleanup of the aquifer; installation of variable-frequency controllers on the well pump motors; changing fan drives to reduce treatment tower air flow; installation of additional monitoring wells, upgrading existing wells, and continuing routine sampling and analysis of the aquifer; placement of administrative/institutional restrictions on the installation and use of wells; excavation and removal of the septic tanks and drainfield piping on the cleaners property; and placement of administrative restrictions on excavation into the contaminated soils to reduce the risks associated with uncontrolled excavation. Total capital cost for the selected remedial action is estimated to be $334,970 with O&M costs approximately $85,700 per year. The aquifer cleanup level will be addressed in a later decision, based on data gathered during the operation of the selected remedial action.

PERFORMANCE STANDARDS OR GOALS: The maximum recommended occupational air levels for the three volatile organic chemicals of concern are: tetrachloroethylene, 670 mg/m^3; trichloroethylene, 540 mg/m^3; 1,2-dichloroethylene, 790 mg/m^3. These standards are recommended by OSHA and are based on the threshold limit value-time weighted average for an 8-hour exposure.

INSTITUTIONAL CONTROLS: Administrative actions regulating well installation and use of the contaminated aquifer will be required. Additional restrictions on excavation will be necessary to limit exposure to contaminated soil.

COMMENTS: Deferred Decision -- EPA will defer decision on the appropriate level of ground water corrective action.

KEYWORDS: Air Stripping; Aquifer Use Restrictions; Deferred Decision; Excavation; Ground Water; Ground Water Treatment; Offsite Disposal; Organics; Soil; Solvents; Tetrachloroethylene (PCE); Trichloroethylene (TCE); 1,2-dichloroethylene.

SOUTH TACOMA CHANNEL -- WELL 12A, WA
(Second Remedial Action)
May 3, 1985

ROD ABSTRACT

The South Tacoma Channel, Well 12A site is in the City of Tacoma, Washington, and includes industrial, commercial and residential areas. Well 12A is one of 13 wells used by the City to meet peak summer and emergency water demands. Research into the past ownership and activities on these properties indicated that waste oil and solvent reclamation processes and paint and lacquer thinning manufacturing occurred on the site, identified as the source area. As a result of these processes, both the underlying ground water aquifer and portions of the superficial soils show contamination with organic solvents.

The selected remedial action includes: air stripping of the ground water (continue to operate the IRM); extract and treat the ground water at the source to remove volatile organics; drill and sample additional soil test borings during the design phase; remove an appropriate length of railroad track adjacent to the Time Oil property, and excavate; perform additional undercutting; install the drain field piping in the excavated areas and cover with a permeable material; pave or place soil cover on the portions of the unpaved Time Oil parking lot; transport and dispose of all excavated, contaminated soils in a RCRA-permitted landfill; maintain institutional controls; monitor ground water and after two years of operation, evaluate the effectiveness of the ground water extraction and treatment system. Total capital cost for the selected remedial alternative is estimated to be $1,590,000, and O&M costs are estimated to be $50,000 per year.

PERFORMANCE STANDARDS OR GOALS: Specific ground water cleanup goals have not been established. However, a drinking water cancer risk level of 10^{-6} has been recommended.

INSTITUTIONAL CONTROLS: Institutional controls and deed restrictions will prohibit private-party access to portions of the aquifer where cancer risk levels exceed 10^{-6}.

COMMENTS: 1) Offsite Disposal -- No determination has been made as to whether the disposal facility will be single or double lined. 2) Deferred Decisions -- Decisions regarding site closure and the level of ground water quality to be achieved are deferred.

KEYWORDS: Deed Restrictions; Deferred Decision; Dilution; Excavation; Ground Water; Institutional Controls; Offsite Disposal; Soil; Tetrachloroethylene (PCE); Trans-1,2-dichloroethylene; Trichloroethylene (TCE); 1,1,2,2-dichloroethane.

WESTERN PROCESSING, WA
(Second Remedial Action)
September 25, 1985

ROD ABSTRACT

The Western Processing site occupies approximately 13 acres in Kent, King County, Washington. Originally, Western Processing was a reprocessor of animal by-products and brewer's yeast. In the 1960s the business expanded to recycle, reclaim, treat and dispose of many industrial wastes, including waste oils, electroplating wastes, waste pickle liquor, battery acids, steel mill flue dust, pesticides, spent solvents, and zinc dross. Some of the Pacific Northwest's largest industries had contracts with Western Processing to handle their wastes. In March 1981, EPA inspected the site and found numerous RCRA violations. Further investigations found extensive contamination of soil, surface water and ground water both on and offsite. This prompted EPA to issue a CERCLA Section 106 order in April 1983 requiring the owners/operators to cease operations immediately. Current investigations have found approximately 90 of the 126 priority pollutants in the soil or ground water on and off the Western Processing site, or in Mill Creek.

In August 1984, the first remedial action was approved and a group of over 190 PRPs eventually agreed to undertake surface cleanup and stormwater control actions. This second remedial action includes: intensive soil sampling and analysis on and offsite during the remedial design; selective excavation and offsite disposal of highly contaminated soils, drums and buried wastes in Area I (about 10% of the material in the top six feet of soil) to reduce the source strength; excavation, or cleaning and plugging all utility and process lines in Area I; following the remedial design, excavation of all soils which exceed the $1x10^{-5}$ excess cancer risk level; covering/capping all remaining surface soils contaminated with priority pollutants above background levels; maintenance of cover/caps; excavation of utility manholes/vaults near the site; removal or decontamination of the lead-contaminated house in Area 8; construction of a ground water extraction and pre-treatment plant, with operation for a period up to five years; construction, operation and maintenance of a stormwater control system; intensive monitoring of Mill Creek, the east drain, the ground water and the ground water extraction system performance, combined with tests and implementation of system modifications; excavation of contaminated Mill Creek sediments; bench-scale tests of soil solidification techniques, and if system performance should dictate, pilot scale tests of in-situ solidification technologies; and performance of supplemental remedial planning studies if shallow ground water contamination beyond the currently contaminated zone or significant regional contamination is detected. Total capital cost for the selected remedial alternative is estimated to be $18,100,000 with O&M costs approximately $2,000,000 to $3,000,000 depending upon the results of pilot scale studies on innovative technologies. The final operable unit for this site may include further ground water and soil remedies plus site closure activities. These remedial actions will be addressed in another ROD following the performance evaluation of the second operable unit.

WESTERN PROCESSING, WA
(Continued)

PERFORMANCE STANDARDS OR GOALS: Two major performance standards are outlined in the ROD: 1) Prevent further degradation of shallow ground water, and 2) Reduce ground water contamination to levels that will protect aquatic organisms in Mill Creek. These levels are based primarily on Maximum Concentration Limits (MCLs), but if these limits cannot be met, Alternate Concentration Limits (ACLs) may be established in a future ROD. All soils contaminated with PCBs over 2 ppm will be excavated. "Hot spots" with any contaminant exceeding a cancer risk level of 1 x 10^{-5} will also be excavated.

INSTITUTIONAL CONTROLS: Institutional controls on both State and local levels may be proposed to restrict ground water extraction from Area I. These controls would be addressed in a future ROD. Title and deed restrictions may be recommended if offsite areas are capped rather than excavated.

COMMENTS: 1) Consolidation -- Offsite contaminated soils will be excavated and consolidated onsite in Area I, if they contain no PCBs or extremely hazardous waste as defined by the Washington State Department of Ecology (WDOE). 2) Offsite Disposal -- Selected waste materials will be disposed of offsite at a RCRA-approved double lined landfill.

KEYWORDS: ACL; Alternative Technology; Capping; Chromium; Creek Sediments; Deed Restrictions; Excavation; Ground Water; Ground Water Treatment; Heavy Metals; Institutional Controls; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Organics; PCBs; Phenols; Polynuclear Aromatic Hydrocarbons (PAH); RCRA Closure Requirements; RCRA Landfill Specifications; Soil; Surface Water; Toluene.

ROD KEY WORD LIST

05/23/86

SUPERFUND RECORDS OF DECISION:
KEY WORD INDEX

Listed below are major key word categories and their sub-categories for Superfund Records of Decision (RODs). Opposite each of these categories are the sites whose ROD contains the listed key word. The Superfund managers in each Region have copies of all RODs.

KEY WORDS (By Category)	ASSOCIATED ROD SITES
Primary Hazardous Substances Detected	**Site, State, (Region)**
Acids	Charles George, MA (I)*; Nyanza Chemical, MA (I); Western Sand & Gravel, RI (I); Chemical Control, NJ (II); PAS Oswego, NY (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Lackawanna Refuse Site, PA (III); A&F Materials-IRM, IL (V); Chem-Dyne-EDD, OH (V); Highlands Acid Pit, TX (VI); Tar Creek, OK (VI); Celtor Chemical Works, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)
Arsenic	Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Douglassville, PA (III); McAdoo-IRM, PA (III); Moyer Landfill, PA (III); American Creosote, FL (IV); Davie Landfill, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Morris Arsenic, MN (V); Milltown, MT (VIII); Milltown-S, MT (VIII); Celtor Chemical, CA (IX)*; McColl, CA (IX); Western Processing, WA (X)
Asbestos	New Lyme, OH (V); Mountain View/Globe, AZ (IX)
Carcinogenic Compounds	Charles George, MA (I); Hocomonco Pond, MA (I); Taylor Borough, PA (III); Reilly Tar, MN (V)
Chromium	Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); D'Imperio Property, NJ (II); Lipari Landfill, NJ (II)*; Sinclair Refinery, NY (II); Spence Farm, NJ (II); Douglassville, PA (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); Davie Landfill, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Northernaire, MI (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Del Norte, CA (IX); Western Processing, WA (X)*
Dioxin	Love Canal, NY (II); Times Beach, MO (VII)

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

77

Primary Hazardous Substances Detected (continued)	Site, State, (Region)
Heavy Metals	Cannon/Plymouth, MA (I); Charles George, MA (I)*; Hocomonco Pond, MA (I); Keefe Environmental, NH (I); Nyanza Chemical, MA (I); Re-Solve, MA (I); Sylvester, NH (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II); D'Imperio Property, NJ (II); GEMS Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NJ (II); Enterprise Avenue, PA (III); Harvey-Knott, DE (III); McAdoo-IRM, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Wade, PA (III); American Creosote, FL (IV); Miami Drum Svcs, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Byron/Johnson Salvage Yard, IL (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); Old Inger, LA (VI); MOTCO, TX (VI); Tar Creek, OK (VI); Milltown, MT (VIII); Milltown-S, MT (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Jibboom Junkyard, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X); Western Processing, WA (X)*
Inorganics	Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Bog Creek Farm, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); Sinclair Refinery, NY (II); Douglassville, PA (III); Drake Chemical, PA (III); Harvey-Knott, DE (III); McAdoo-IRM, PA (III); Wade, PA (III); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Reilly Tar, MN (V); Wauconda Sand & Gravel, IL (V); MOTCO, TX (VI); Tar Creek, OK (VI); Ellisville, MO (VII)
Mining Wastes	Tar Creek, OK (VI); Milltown, MT (VIII); Celtor Chemical Works, CA (IX)
Oils	McKin, ME (I)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Bruin Lagoon, PA (III); Enterprise Avenue, PA (III); Miami Drum Services, FL (IV); A&F Materials-IRM, IL (V); Forest Waste-IRM, MI (V); Laskin/Poplar Oil, OH (V); New Lyme, OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Old Inger, LA (VI); Ellisville, MO (VII); Western Processing, WA (X)

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Organics/VOCs	Beacon Heights, CT (I); Charles George, MA (I); Hocomonco Pond, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Re-Solve, MA (I); Western Sand & Gravel, RI (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Douglassville, PA (III); Drake Chemical, PA (III); Harvey-Knott, DE (III); McAdoo-IRM, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Wade, PA (III); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); A&F Materials-IRM, IL (V); A&F Materials Company-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); Kummer Landfill, MN (V); Main St. Wellfield, IN (V); New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V); New Lyme, OH (V); Old Mill OH (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); South Valley-IRM, NM (VI); Triangle Chemical, TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Ellisville, MO (VII); Woodbury Chemical, CO (VIII); Del Norte, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Ponders Corner-IRM, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*
PAH (Polynuclear Aromatic Hydrocarbons)	Cannon/Plymouth, MA (I); Douglassville, PA (III); Taylor Borough, PA (III); American Creosote, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Laskin/Poplar Oil, OH (V); Reilly Tar, MN (V); Western Processing, WA (X)*
PCBs (Polychlorinated Biphenyls)	Picillo Farm, RI (I); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); Goose Farm, NJ (II); Hudson River, NY (II); Krysowaty Farm, NJ (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Swope Oil (II); Wide

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	Site, State, (Region)
PCBs (Polychlorinated Biphenyls) (continued)	Beach, NY (II); Douglassville, PA (III); Harvey-Knott, DE (III); Lehigh Electric, PA (III); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Forest Waste-IRM, MI (V); Laskin/Poplar Oil, OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Bio-Ecology Systems, TX (VI); MOTCO, TX (VI); Jibboom Junkyard, CA (IX); Taputimu Farm, AS (IX); Western Processing, WA (X)*
PCE (Tetrachloroethylene/ Perchloroethylene)	Keefe Environmental, NH (I); Picillo Farm, RI (I); Fischer & Porter, PA (III); Charlevoix, MI (V); Charlevoix, MI (V)*; Main St. Wellfield, IN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; San Gabriel/ Area I, CA (IX); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*
Pesticides	Cannon/Plymouth MA (I); Chemical Control, NJ (II); Krysowaty Farm, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Pijak Farm, NJ (II); Douglassville, PA (III); Drake Chemical, PA (III); Miami Drum Svcs, FL (IV); Chem-Dyne-EDD, OH (V); Old Inger, LA (VI); Aidex-IRM, IA (VII); Ellisville, MO (VII); Woodbury Chemical, CO (VIII); Del Norte, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Western Processing, WA (X)
Phenols	Hocomonco Pond, MA (I); Picillo Farm, RI (I); Goose Farm, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Douglassville, PA (III); Sand, Gravel & Stone, MD (III); Whitehouse Waste Oil Pits, FL (IV); Laskin/Poplar Oil, OH (V); Ellisville, MO (VII); Western Processing, WA (X)*
Radioactive Materials	Lansdowne Radiation, PA (III); Moyer Landfill, PA (III); Denver Radium Site Streets, CO (VIII)
Sludge	Bridgeport, NJ (II); Price Landfill, NJ (II); Swope Oil, NJ (II); Bruin Lagoon, PA (III); Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); McAdoo Associates, PA (III)*; Davie Landfill, FL (IV); Berlin & Farro, MI (V); Forest Waste-IRM, MI (V); Laskin/Poplar Oil, OH, (V); New Lyme, OH (V); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Ellisville, MO (VII); McColl, CA (IX)

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

80

Primary Hazardous Substances Detected (continued)	Site, State, (Region)
Solvents	Keefe Environmental, NH (I); McKin, ME (I)*; Western Sand & Gravel, RI (I); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); Spence Farm, NJ (II); Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Miami Drum Svcs, FL (IV); A&F Materials-IRM, IL (V); Berlin & Farro, MI (V); Charlevoix, MI (V); Cross Bros., IL (V); New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V); New Lyme, OH (V); Old Mill, OH (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Old Inger, LA (VI); Ellisville, MO (VII); Taputimu Farm, AS (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); Western Processing, WA (X)
Synfuels	Western Processing, WA (X)
TCE (Trichloroethylene)	Charles George, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); Western Sand & Gravel, RI (I); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Olean Well Field, NY (II); Fischer & Porter, PA (III); Heleva Landfill, PA (III); Moyer Landfill, PA (III); Taylor Borough, PA (III); Acme Solvents, IL (V); Charlevoix, MI (V); Charlevoix, MI (V)*; LeHillier/Mankato, MN (V); Main St. Wellfield, IN (V); New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); San Gabriel/Area I, CA (IX); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)
Toluene	Charles George, MA (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Sinclair Refinery, NY (II); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Taylor Borough, PA (III); American Creosote, FL (IV); New Lyme, OH (V); Verona Well Field, MI (V)*; Triangle Chem., TX (VI); Ellisville, MO (VII); Western Processing, WA (X)*

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media	Site, State, (Region)
Air	McKin-IRM, ME (I); Sylvester, NH (I); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Love Canal, NY (II); Heleva Landfill, PA (III); Taylor Borough, PA (III); Wade, PA (III); Berlin & Farro, MI (V); Chem-Dyne-EDD, OH (V); Outboard Marine, IL (V); Verona Well Field-IRM, MI (V); Mountain View/Globe, AZ (IX); Taputimu Farm, AS (IX); South Tacoma, WA (X)
Ground Water	Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Charles George, MA (I); Hocomonco Pond, MA (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Re-Solve, MA (I); Sylvester, NH (I); Western Sand & Gravel, RI (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Fischer & Porter, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Tyson's Dump, PA (III); Wade, PA (III); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); Davie Landfill, FL (IV); Miami Drum Services, FL (IV); Varsol Spill Site, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); LeHillier/Mankato, MN (V); Main St. Wellfield, IN (V); New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V); New Lyme, OH (V); Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); South Valley-IRM, NM (VI); Tar Creek, OK (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Milltown-S, MT (VIII); Celtor Chemical Works, CA (IX); Del Norte, CA (IX); McColl, CA (IX); San Gabriel/Area I, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media (continued)	**Site, State, (Region)**
Sediments (Creek/River/ Stream)	Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); GEMS Landfill, NJ (II); Hudson River, NY (II); Love Canal, NY (II); Pijak Farm, NJ (II); Wide Beach, NY (II); Douglassville, PA (III); Harvey-Knott, DE (III); Sand, Gravel & Stone, MD (III); Tyson's Dump, PA (III); American Creosote, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Milltown, MT (VIII); Woodbury Chemical (VIII); Western Processing, WA (X)*
Sludge	Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Bridgeport, NJ (II); Swope Oil, NJ (II); American Creosote, FL (IV); Berlin & Farro, MI (V); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); Old Inger, LA (VI)
Soil	Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Re-Solve, MA (I); Western Sand & Gravel, RI (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Wide Beach, NY (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Harvey-Knott, DE (III); Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); Lansdowne Radiation, PA, (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Matthews Electroplating, VA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Wade, PA (III); American Creosote, FL (IV); Hollingsworth, FL (IV); Miami Drum Services, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Forest Waste-IRM, MI (V); Laskin/Poplar Oil, OH (V); Main St. Wellfield, IN (V); Morris Arsenic, MN (V); New Lyme, OH (V); Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Schmalz Dump, WI (V); Verona Well Field, MI (V)*; Wauconda Sand &

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* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media (continued)	Site, State, (Region)
Soil (continued)	(V); Bayou Bonfouca, LA (VI); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Triangle Chem., TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Ellisville, MO (VII); Times Beach, MO (VII); Milltown, MT (VIII); Milltown-S, MT (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); Mountain View/Globe, AZ (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*
Surface Water	Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Re-Solve, MA (I); Sylvester, NH (I); Burnt Fly Bog, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Hudson River, NY (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Fischer & Porter PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Lackawanna Refuse Site, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); Berlin & Farro, MI (V); Chem-Dyne-EDD, OH (V); Laskin/Poplar Oil, OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Wauconda Sand & Gravel, IL (V); Bio-Ecology Systems, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Tar Creek, OK (VI); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*
Wetlands	Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Helen Kramer, NJ (II); PAS Oswego, NY (II); Wide Beach, NY (II); Harvey-Knott, DE (III); Schmalz Dump, WI (V); Old Inger, LA (VI); Tar Creek, OK (VI)
Wood	Lansdowne Radiation, PA (III); Old Inger, LA (VI)

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

Public Health and Environmental Threats	Site, State, (Region)
Direct Contact	Hudson River, NY (II); Love Canal, NY (II); Pijak Farm, NJ (II); Spence Farm, NJ (II); Forest Waste-IRM, MI (V)
Public Exposure	Burnt Fly Bog, NJ (II); Love Canal, NY (II); Lansdowne Radiation, PA (III); Verona Well Field-IRM, MI (V); McColl, CA (IX)
Public Health Risk	Re-Solve, MA (I); Reilly Tar, MN (V)
Risk Assessment	Love Canal, NY (II); Verona Well Field-IRM, MI (V)
Risk Level	Picillo Farm, RI (I); Krysowaty Farm, NJ (II); Fischer & Porter, PA (III); San Gabriel/Area 1, CA (IX)
Volatilization	Hudson River, NY (II)
Remedy Selection	
Consent Decree	Fischer & Porter, PA (III); A&F Materials Company-EDD, IL (V); Chem-Dyne-EDD, OH (V)
Cost/Benefit	Krysowaty Farm, NJ (II)
Cost Recovery	Wade, PA (III)
Deed Restriction	Friedman Property, NJ (II); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Fund Balancing	Outboard Marine Corp., IL (V)
Ground Water Strategy	Western Sand & Gravel, RI (I); Tar Creek, OK (VI); Del Norte, CA (IX)
Negotiated Settlement	Western Sand & Gravel, RI (I); Wade, PA (III)
No Action Alternative	Friedman Property, NJ (II); Taylor Borough, PA (III)*; Varsol Spill, FL (IV); Morris Arsenic, MN (V)
O & M	Re-Solve, MA (I); Burnt Fly Bog, NJ (II); D'Imperio Property, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Spence Farm, NJ (II); Bruin Lagoon, PA (III); Drake Chemical, PA (III); Heleva Landfill, PA (III); Matthews Electroplating, VA (III); Whitehouse Waste Oil Pits, FL (IV); Byron/Johnson Salvage Yard, IL (V);

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

Remedy Selection (continued)	**Site, State, (Region)**
O&M (continued)	Charlevoix, MI (V); Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); Old Mill, OH (V); Reilly Tar, MN (V); Verona Well Field-IRM, MI (V); Bio-Ecology Systems, TX (VI); Old Inger, LA (VI); Tar Creek, OK (VI); Aidex, IA (VII)*; Milltown, MT (VIII); San Gabriel/Area I, CA (IX); Stringfellow Acid Pits, CA (IX)*; Ponders Corner-IRM, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
PRP	Enterprise Avenue, PA (III); Moyer Landfill, PA (III); Wade, PA (III)
PRP Alternative	Lone Pine Landfill, NJ (II)
Supplemental ROD	Sylvester, NH (I); Milltown, MT (VIII)
Shared Costs	Matthews Electroplating, VA (III); Milltown, MT (VIII)
Temporary Remedial Measure	Hudson River, NY (II)
Other Agencies	
COE	Old Inger, LA (VI)
DOD	New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V)
Water Supply	
Alternate Water Supply	Charles George, MA (I); Krysowaty Farm, NJ (II); Bridgeport, NJ (II); Olean Well Field, NY (II); Price Landfill, NJ (II); Fischer & Porter, PA (III); Matthews Electroplating, VA (III); Acme Solvents, IL (V); Charlevoix, MI (V); Eau Claire-IRM, WI (V); Kummer Landfill, MN (V); New Brighton-Water Supply System, MN (V); Old Mill, OH (V); Reilly Tar, MN (V); Verona Well Field-IRM, MI (V); South Valley-IRM, NM (VI); Milltown, MT (VIII)
Community Services Enhancement	Price Landfill, NJ (II); Milltown, MT (VIII)
Drinking Water Contaminants	Fischer & Porter, PA (III); Eau Claire-IRM, WI (V); Main St. Wellfield, IN (V); Verona Well Field-IRM, MI (V); South Valley-IRM, NM (VI)

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Water Supply (continued)	**Site, State, (Region)**
Fire Protection	Western Sand & Gravel, RI (I); New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V); Milltown, MT (VIII)
Internal Plumbing	Milltown-S, MT (VIII)
Water Rights	San Gabriel/Area 1, CA (IX)
Site Specific Characteristics	
Flood Plain	Helen Kramer, NJ (II); Drake Chemical, PA (III); A&F Materials-IRM, IL (V); Bayou Bonfouca, LA (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Triangle Chemical, TX (VI); Celtor Chemical, CA (IX)*
Ground Water Table	Re-Solve, MA (I); A&F Materials-IRM, IL (V)
Hydrogeologic	Heleva Landfill, PA (III); Berlin & Farro, MI (V)
Seismic	McColl, CA (IX)
Sole-Source Aquifer	Price Landfill, NJ (II); Biscayne Aquifer Sites, FL (IV)
Subsidence	McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Wauconda Sand & Gravel, IL (V); Highlands Acid Pit, TX (VI)
Standards/Regulations/ Permits/Guidance	
Air Emissions	Verona Well Field-IRM, MI (V)
Air Permits	San Gabriel/Area 1, CA (IX)
Air Quality	Bridgeport, NJ (II); Verona Well Field-IRM, MI (V); San Gabriel/Area 1, CA (IX)
ACL	Sylvester, NH (I); Western Sand & Gravel, RI (I); Bog Creek Farm, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Harvey-Knott, DE (III); Highlands Acid Pit, TX (VI); Aidex, IA (VII)*; Old Mill, OH (V); Western Processing, WA (X)*
Ambient Water Quality Criteria	New Brighton-Water Supply System, MN (V)

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Standards/Regulations/ Permits/Guidance (continued)	Site, State, (Region)
Aquifier Use Restrictions	Biscayne Aquifer Sites, FL (IV); Old Mill, OH (V); Ponders Corner, WA (X)*
Background Levels	Nyanza Chemical, MA (I); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Reilly Tar, MN (V); Triangle Chemical, TX (VI); Aidex, IA (VII)*
Clean Water Act 404 Permit	PAS Oswego, NY (II); Old Inger, LA (VI); Tar Creek, OK (VI)
Discharge Standards	Old Inger, LA (VI)
Drinking Water Standards	Old Inger, LA (VI); South Valley-IRM, NM (VI); Milltown, MT (VIII)
Environmental Standards	San Gabriel/Area 1, CA (IX)
Feasibility Study Guidance Document	San Gabriel/Area 1, CA (IX)
Institutional Controls	Beacon Heights, CT (I); Friedman Property, NJ (II); Olean Well Field, NY (II); Biscayne Aquifer Sites, FL (IV); Charlevoix, MI (V)*; Old Mill, OH (V); Old Inger, LA (VI); Denver Radium Site Streets, CO (VIII); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
NEPA	Outboard Marine Corp., IL (V)
Public Health Advisory	Lansdowne Radiation, PA (III)
RCRA	Western Sand & Gravel, RI (I); Love Canal, NY (II); PAS Oswego, NY (II); Aidex, IA (VII)*
RCRA Part 264	Charles George, MA (I)*; PAS Oswego, NY (II); McAdoo Associates, PA (III)*; Wade, PA (III); Reilly Tar, MN (V); Bio-Ecology Systems, TX (VI); Old Inger, LA (VI); Aidex, IA (VII)*; Del Norte, CA (IX)
RCRA Closure Requirements	Bridgeport, NJ (II); Enterprise Avenue, PA (III); Moyer Landfill, PA (III); Tyson's Dump, PA (III); South Tacoma, WA (X); Western Processing, WA (X)*
RCRA Landfill Specifications	Picillo Farm, RI (I); Drake Chemical, PA (III); Tyson's Dump, PA (III); American Creosote, FL (IV); Bio-Ecology Systems, TX (VI); Western Processing, WA (X)*

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Standards/Regulations/ Permits/Guidance (continued)	**Site, State, (Region)**
RCRA Locational Requirements	Tyson's Dump, PA (III); Berlin & Farro, MI (V)
RCRA Onsite Disposal Requirements	Picillo Farm, RI (I); McColl, CA (IX)
SNARL	Lipari Landfill, NJ (II)*; San Gabriel/Area 1, CA (IX)
State Criteria	Bridgeport, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); South Tacoma, WA (X)
State Permit	D'Imperio Property, NJ (II); Goose Farm, NJ (II); Verona Well Field-IRM, MI (V)
TSCA Onsite Disposal Requirements	Picillo Farm, RI (I); Krysowaty Farm, NJ (II)
Water Quality	Fischer & Porter, PA (III); Outboard Marine Corp., IL (V); Milltown, MT (VIII); South Tacoma, WA (X)
Water Quality Criteria	Lipari Landfill, NJ (II)*; Verona Well Field-IRM, MI (V)
Wetlands Regulations	PAS Oswego, NY (II)
Testing/Pilot Studies	
Leachability Tests	Re-Solve, MA (I)
Treatability Studies	Old Inger, LA (VI)
Technology	
Aeration	McKin, ME (I); Triangle Chem., TX (VI)
Air Stripping	Olean Well Field, NY (II); Main St. Wellfield, IN (V); Tyson's Dump, PA (III); Biscayne Aquifer Sites, FL (IV); Eau Claire-IRM, WI (V); LeHillier/Mankato, MN (V); Verona Well Field-IRM, MA (V); Verona Well Field, MI (V)*; San Gabriel/Area I, CA (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*
Alternative Technology	Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Goose Farm, NJ (II); Wide Beach, NY (II); MOTCO, TX (VI); Triangle Chemical, TX (VI); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	Site, State, (Region)
Best Reliable Technology	Reilly Tar, MN (V); Western Processing, WA (X)
Capping	Beacon Heights, CT (I); Charles George, MA (I)*; Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Re-Solve, MA (I); Sylvester, NH (I); Bog Creek Farm, NJ (II); D'Imperio Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); PAS Oswego, NY (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Douglassville, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Heleva Landfill, PA (III); Lackawanna Refuse Site, PA (III); Matthews Electroplating, VA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Tyson's Dump, PA (III); Wade, PA (III); Davie Landfill, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Chem-Dyne-EDD, OH (V); New Lyme, OH (V); Old Inger, LA (VI); Aidex, IA (VII)*; Mountain View/Globe, AZ (IX); South Tacoma, WA (X); Western Processing, WA (X)*
Containment	Hudson River, NY (II); Lipari Landfill, NJ (II)*; Drake Chemical, PA (III); New Lyme, OH (V); Outboard Marine Corp., IL (V); Times Beach, MO (VII)
Dike Stabilization	Bruin Lagoon, PA (III); Ellisville, MO (VII)
Dredging	Hocomonco Pond, MA (I); Hudson River, NY (II); Love Canal, NY (II); Outboard Marine Corp., IL (V); Tar Creek, OK (VI)
Excavation	Beacon Heights, CT (I); Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); D'Imperio Property, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Wide Beach, NY (II); Douglassville, PA (III); Drake Chemical, PA (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); American Creosote, FL (IV); Miami Drum Svcs, FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Bayou Bonfouca, LA (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Aidex, IA (VII)*; Ellisville, MO (VII); Times Beach, MO (VII); Denver Radium Site Streets, CO

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

Technology (continued)	Site, State, (Region)
Excavation (continued)	(VIII); Woodbury Chemical, CO (VIII); Celtor Cnemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Filling	Lehigh Electric, PA (III); Taylor Borough, PA (III); Wade, PA (III); A&F Materials-EDD, IL (V); Tar Creek, OK (VI); Woodbury Chemical, CO (VIII)
Granular Activated Carbon	New Brighton-Interim Water Treatment, MN (V); New Lyme, OH (V); Reilly Tar, MN (V); Old Inger, LA (VI); San Gabriel/Area 1, CA (IX); Stringfellow Acid Pits, CA (IX)*
Ground Water Diversion	Nyanza Chemical, MA (I); Bruin Lagoon, PA (III)
Ground Water Monitoring	Beacon Heights, CT (I); Hocomonco Pond, MA (I); McKin, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Burnt Fly Bog, NJ (II); Friedman Property, NJ (II); Krysowaty Farm, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Drake Chemical, PA (III); Moyer Landfill, PA (III); Taylor Borough, PA (III)*; A&F Materials-EDD, IL (V); New Lyme, OH (V); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); Aidex, IA (VII)*; Woodbury Chemical, CO (VIII)
Ground Water Treatment	McKin, ME (I); Sylvester, NH (I); Sylvester-S, NH (I); D'Imperio Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Olean Well Field, NY (II); PAS Oswego, NY (II); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Whitehouse Waste Oil Pits, FL (IV); Chem-Dyne-EDD, OH (V); LeHillier/Mankato, MN (V); New Lyme, OH (V); Old Mill, OH (V); Verona Well Field, MI (V)*; Del Norte, CA (IX); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Hydraulic Barrier	South Tacoma, WA (X)
Incineration	Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Swope Oil, NJ (II); Lackawanna Refuse Site, PA (III); Acme Solvents, IL (V); Berlin & Farro, MI (V); Laskin/Poplar Oil, OH (V); MOTCO, TX (VI); Triangle Chem., TX (VI); Woodbury Chemical, CO (VIII); Western Processing, WA (X)
Land Treatment	Old Inger, LA (VI)

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* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

Technology (continued)	Site, State, (Region)
Leachate Collection/ Treatment	Beacon Heights, CT (I); Charles George, MA (I)*; Picillo Farm, RI (I); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Moyer Landfill, PA (III); New Lyme, OH (V); Wauconda Sand & Gravel, IL (V)
Levees	Douglassville, PA (III); Old Inger, LA (VI)
Offsite Disposal	Cannon/Plymouth, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); McKin, ME (I)*; Re-Solve, MA (I); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Krysowaty Farm, NJ (II); Pijak Farm, NJ (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Bruin Lagoon, PA (III); Enterprise Avenue, PA (III); Harvey-Knott, DE (III); Lackawanna Refuse Site, PA (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Sand, Gravel & Stone, MD (III); Taylor Borough, PA, (III); Miami Drum Services, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Triangle Chem., TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Ellisville, MO (VII); Denver Radium Site Streets, CO (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*
Onsite Containment	Re-Solve, MA (I); Enterprise Avenue, PA (III); Davie Landfill, FL (IV); New Lyme, OH (V); Outboard Marine Corp., IL (V); Bio-Ecology Systems, TX (VI); Times Beach, MO (VII); Western Processing, WA (X)*
Onsite Disposal	Hocomonco Pond, MA (I); Picillo Farm, RI (I); Love Canal, NY (II); Drake Chemical, PA (III); Enterprise Avenue, PA (III); American Creosote, FL (IV); Aidex, IA (VII)*; Mountain View/Globe, AZ (IX); Western Processing, WA (X)*
Relocation	Lansdowne Radiation, PA (III); Times Beach, MO (VII); Mountain View/Globe, AZ (IX)

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* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	**Site, State, (Region)**
Packed Column Aeration	Fischer & Porter, PA (III)
Plume Management	Price Landfill, NJ (II); Verona Well Field-IRM, MI (V)
Publicly Owned Treatment Works (POTW)	GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Del Norte, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*
Slurry Wall	Sylvester, NH (I); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); PAS Oswego, NY (II); Whitehouse Waste Oil Pits, FL (IV)
Spur Levees	Times Beach, MO (VII)
Stabilization	Re-Solve, MA (I); Bruin Lagoon, PA (III)
Surface Water Diversion/ Collection	Charles George, MA (I)*; McKin, ME (I)*; Nyanza Chemical, MA (I); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Moyer Landfill, PA (III); Taylor Borough, PA (III)
Venting	Beacon Heights, CT (I); Charles George, MA (I)*; GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Heleva Landfill, PA (III); Moyer Landfill, PA (III); New Lyme, OH (V)
Miscellaneous	
Competitive Bidding	Bridgeport, NJ (II)
Deferred Decision	Cannon/Plymouth, MA (I); Lipari Landfill, NJ (II)*; Swope Oil, NJ (II); Douglassville, PA (III); McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Tyson's Dump, PA (III); American Cresote, FL (IV); Davie Landfill, FL (IV); Bayou Bonfouca, LA (VI); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*
Depth of Excavation	Burnt Fly Bog, NJ (II)
Dilution	South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*
Environmental Impacts	Hudson River, NY (II); PAS Oswego, NY (II); Highlands Acid Pit, TX (VI); Tar Creek, OK (VI); Stringfellow Acid Pits, CA (IX)*
Federal Facilities	New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V)

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* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Miscellaneous (continued)	**Site, State, (Region)**
Key Indicator Analysis	Enterprise Avenue, PA (III)
Municipally-Owned Site	Enterprise Avenue, PA (III)
Off-Base Contamination	New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V)
Remnant Contamination	Bog Creek Farm, NJ (II); Krysowaty Farm, NJ (II)

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* Second Record of Decision

S Supplemental Record of Decision
EDD Enforcement Decision Document

INDEX OF APPROVED REMEDIAL ACTIONS

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
01	Beacon Heights, CT	1st Remedial Action	9/23/85	. Excavation of Betkoski's Dump and other contaminated soils with consolidation onsite . RCRA capping of consolidated wastes, gas venting and stormwater management . Installation of leachate collection system . Collection of leachate and offsite disposal at a licensed waste water treatment facility, or onsite treatment and discharge to Hockanum Brook . Extension of public water supply to the next municipal supply . Fence entire site . Installation of a more extensive ground water monitoring system	. Ground water		
01	Cannon Engineering/ Plymouth, MA	1st Remedial Action	9/30/85	. Removal and offsite disposal of tanks, associated pipework and foundation to a RCRA approved facility			
01	Charles George, MA	1st Remedial Action	12/29/83	. Extend existing water supply system	. Ground water . Source control		
01	Charles George, MA	2nd Remedial Action	7/11/85	. Full synthetic membrane cap . Surface water diversion and collection system . Vent network with off-gas collection system venting to the atmosphere . Full peripheral leachate collection system	. Ground water . Offsite RI/FS . Wetlands . Source control		
01	Hocomonco Pond, MA	1st Remedial Action	9/30/85	1) Former Lagoon - Site grading - Capping - Relocation of storm drain pipe 2) Kettle Pond Area - Dewatering the pond and lowering area ground water levels - Soil/waste excavation - Dewatering sediments, and onsite landfilling - Monitoring air quality with treatment if necessary	. Source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
01	Hocomonco Pond, MA (cont.)			- Treatment with discharge of effluent water - Construction of onsite landfill - Restoration of wetland areas 3) Hocomonco Pond and Discharge Stream - Mechanical dredging and onsite disposal of sediments - Treatment of pond water in system constructed for Kettle Pond area 4) Otis Street - Seal storm drain 5) Isolated Areas - Removal of contaminated materials and onsite disposal			
01	Keefe Environmental, NH	1st Remedial Action	11/15/83	. Removal and offsite disposal of lagoon contents and liner and highly contaminated soil	. Ground water . Surface water		
01	McKin Site, ME	IRM	7/15/83	. Onsite cleaning and salvage of tanks . Offsite disposal of liquids and sludges	. Ground water . Soil		
01	McKin Site, ME	2nd Remedial Action	7/22/85	. Onsite aeration of soils . Offsite disposal of approximately 16 drums . Soil tests in petroleum contaminated areas . Construct a ground water extraction, treatment, and surface water discharge system . Reevaluate ground water performance standards . Offsite ground water and surface water monitoring program . Site removal and closure activities	. No further action		
01	Nyanza Chemical, MA	1st Remedial Action	9/4/85	. Excavation and consolidation of sludge deposits/sediments . Construct RCRA cap over entire Hill area . Upgradient surface and ground water diversion system . Downgradient ground water monitoring system	. Ground water . Sediments . Wetlands		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
01	Picillo Farm, RI	1st Remedial Action	9/30/85	• Onsite disposal of primarily PCB and phenol contaminated soils in a RCRA/TSCA landfill • Site closure activities	• Ground water		
01	Re-Solve, MA	1st Remedial Action	7/1/83	• Excavation and offsite disposal of lagoon contents and highly contaminated soil • Cap entire site with 2' of clay	• Ground water • Offsite contamination		
01	Sylvester, NH	IRM	7/29/82	• Installation of a slurry wall • Impervious cap	• No further action		
		Supplemental	9/22/83	• Ground water extraction and treatment system			
01	Western Sand & Gravel, RI	1st Remedial Action	9/28/84	• Installation of carbon canister filters as a temporary measure • Installation of a permanent alternate water supply	• Source control • Ground water		
02	Bog Creek Farm, NJ	1st Remedial Action	9/30/85	• Remove waste water and sediments from pond and bog, regrade and cover both areas • Treat waste water and discharge to stream • Excavate VOC contaminated soil and incinerate onsite or offsite • Evaluate soil washing, segregation and other technologies to reduce the volume of soils to be incinerated • Cover excavated area with compacted soil cap • Install security fence around site and work areas • Implement monitoring program to assess effectiveness of remedial action	• Soil		
02	Bridgeport, NJ	1st Remedial Action	12/31/84	• Disposal of oily waste and sediment/sludge via onsite incineration • Removal and disposal of contaminated water by onsite treatment • Drum excavation and removal offsite • Maintenance pumping of the ground water • Removal and offsite disposal of tanks and waste • Installation of a water supply pipeline	• Ground water • Lagoon closure		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Burnt Fly Bog, NJ	1st Remedial Action	11/16/83	. Excavation and offsite disposal of liquids, sludges, asphalt piles, drums, contaminated soil from lagoons and northern wetlands . Restore site's original contours and vegetation . Monitor ground water for five years	. Further study of the western wetlands		
02	Chemical Control, NJ	1st Remedial Action	9/19/83	. Removal of gas cylinders . Reconstruction of storm sewer catch basins and grates . Cleaning of the storm sewer system and construction of curbing . Decontamination of box trailer and vacuum truck	. Ground water . Soil . Source control		
02	D'Imperio Property, NJ	1st Remedial Action	3/27/85	. Excavation and offsite disposal of contaminated waste, soil and surface drums . Construction of a RCRA cap . Pump and treat ground water	. No further action		
02	Friedman Property, NJ	1st Remedial Action	4/30/85	. No action . Monitoring onsite wells for five years . Deed restrictions	. No further action		
02	GEMS Landfill, NJ	1st Remedial Action	9/27/85	. Construction of cap, regrading of existing landfill slopes . Construction of active gas collection and treatment system . Construction of ground water pumping and treatment system, treatment and discharge of ground water to POTW or surface waters . Remediation of Holly Run and Briar Lake . Construction of surface water controls . Implementation of monitoring program . Construction of fence . Extend existing water supply system			
02	Goose Farm, NJ	1st Remedial Action	9/27/85	. Flush contaminated soil and ground water underlying site, treat ground water and reinject into soil . Conduct testing program to determine the need to cap the site	. Soil		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Goose Farm, NJ (cont.)			. Conduct testing program to determine extent of PCB contamination in drum pit area, determine need for soil remediation			
02	Helen Kramer, NJ	1st Remedial Action	9/27/85	. Construct ground water/leachate collection trench . Install clay cap and slurry wall . Construct active gas collection and treatment system . Dewater, excavate and fill leachate ponds and lagoons . Fence site and work areas . Implement surface water controls to ensure proper construction, implementation and reliability of remedial components . Implement monitoring program to assess effectiveness of remedial action . Collection and treatment of ground water/leachate from trench, disposal to POTW or surface waters	. No further action		
02	Hudson River, NY	1st Remedial Action	9/25/84	. In-place containment of remnant shoreline deposits . Evaluation of Waterford water treatment facility	. Further evaluation of cleanup technologies for contaminated river sediments		
02	Krysowaty Farm, NJ	1st Remedial Action	6/20/84	. Excavation and offsite disposal of contaminated soil and waste . Provision for a permanent alternate water supply . Monitoring onsite wells for five years	. No further action		
02	Lipari Landfill, NJ	1st Remedial Action	8/3/82	. Installation of slurry wall . Cap . Installation of ground water collection wells . Treatment of ground water within slurry wall at the local POTW	. Surface water . Ground water		
02	Lipari Landfill, NJ	2nd Remedial Action	9/30/85	. Install ground water/leachate extraction and injection wells within containment system to flush and dewater system			

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Lipari Landfill, NJ (cont.)			. Pump and treat ground water/leachate within the containment system and discharge to POTW, surface waters, or approved hazardous waste facility . Install and monitor ground water wells downgradient of the site . Flush containment system to cleanse encapsulated material of water-borne contaminants			
02	Lone Pine Landfill, NJ	1st Remedial Action	9/28/84	. Installation of a slurry wall . Installation of a multi-layer surface seal . Installation of ground water collection wells . Treatment of ground water by a POTW or onsite plant	. Completion of field investigation on the extent of offsite ground water contamination		
02	Love Canal, NY	1st Remedial Action	5/6/85	. Hydraulically clean designated sewers . Remove and dewater contaminated sediments from creeks . Inspect sewer reaches for defects and repair damaged flood gate . Dredge and clean culverts . Construct a berm at the area near the 102nd Street outfall . Interim onsite storage of sediments . Install an administration building	. Further evaluation of permanent remedial alternatives		
02	Olean Wellfield, NY	1st Remedial Action	9/24/85	. Reactivate municipal wells, construct two air-stripping systems, treat ground water, discharge to public water supply system . Extend existing Olean water lines to 93 private well users . Inspect McGraw-Edison industrial sewer and analyze repair and replacement options . Recommend institutional controls restricting ground water use . Initiate source control RI/FS	. Source control		
02	PAS Oswego, NY	1st Remedial Action	6/6/84	. Limited excavation and offsite removal of contaminated soil, subsurface tanks, and drums	. Offsite wetlands study		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	PAS Oswego, NY (cont.)			. Construction of a perimeter slurry wall . RCRA Part 264 cap and site grading . Ground water monitoring . Ground water and leachate recovery and treatment			
02	Pijak Farm, NJ	1st Remedial Action	9/30/84	. Removal and offsite disposal of drums and lab packs . Excavation and offsite disposal of visibly contaminated soil . Pumping and removal of contaminated ground water during excavation . Monitoring onsite wells for five years . Additional soil and stream sampling	. Additional soil and/or sediment excavation . Ground water . Source control		
02	Price Landfill, NJ	1st Remedial Action	9/20/83	. Replacement and relocation of the water supply well field and transmission facilities . Analysis of plume management, source control, and ground water treatment remedies	. Plume management . Source control . Ground water		
02	Sinclair Refinery, NY	1st Remedial Action	9/30/85	. Removal and offsite disposal of 300 drums found on the surface of the Central Elevated Landfill Area (CELA) . Excavation and onsite consolidation in the CELA of waste from the South Landfill area . Fence entire site . Fill the South Landfill with clean fill . Cap the consolidated waste in the CELA using a RCRA approved cap . Partial Genesee River channelization to prevent erosion and flooding	. Refinery portion of the site		
02	Spence Farm, NJ	1st Remedial Action	9/30/84	. Excavation and offsite disposal of all drums, lab packs and visibly contaminated soil . Monitoring onsite wells for five years . Site grading and surface restoration . Additional soil and stream sampling	. Additional soil and/or sediment excavation . Ground water . Source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Swope Oil, NJ	1st Remedial Action	9/27/85	. Removal and offsite disposal of tanks and building debris . Offsite incineration, treatment or disposal of tank contents . Installation of cap . Excavation and offsite disposal of sludge waste area . Excavation and offsite disposal of PCB contaminated soil	. Ground water . Soil		
02	Wide Beach, NY	1st Remedial Action	9/30/85	. Excavation and chemical treatment of PCB contaminated soil . Offsite disposal of contaminated asphaltic material . Use of treated soils as clean fill in excavated areas . Repave roadways and driveways . Treat perched water in sewer trench . Construct hydraulic barrier at end of sewer trench . Conduct pilot plant treatability study to determine effective PCB treatment scheme . Sample for PCBs in soil, sewage and sediments			
03	Bruin Lagoon, PA	1st Remedial Action	6/2/82	. Removal and offsite disposal of liquid lagoon contents . Physical stabilization of lagoons . Effluent pond cleanup . Dike stabilization . Cap . Construction of a ground water diversion channel	. No further action		
03	Douglassville, PA	1st Remedial Action	9/27/85	. Removal and consolidation of contaminated soils and sediments from the drainage ditch, drainage swale, buried lagoon and drum disposal areas and onsite disposal under cap . Cap former sludge lagoon area and sludge disposal area . Install levees and dikes to protect site from 100-year flood event . Conduct predesign study of soils to determine extent of excavation and capping	. Further study of contaminated ground water to assess need for future remedial action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Drake Chemical, PA	1st Remedial Action	9/30/84	• Cap and grade leachate stream • Partial excavation and temporary onsite storage of contaminated sediments • Construction of conduit and granular drains	• Ground water • Surface water • Source control		
03	Enterprise Avenue, PA	1st Remedial Action	5/10/84	• Offsite disposal of soils which fail key indicator parameter test levels • Backfilling of site with soils which passed parameter test • Grade and vegetate site as a final cover	• No further action		
03	Fischer & Porter, PA	1st Remedial Action	5/4/84	• Improvements in manufacturing facility to prevent release • Onsite installation of pumping wells and packed column aeration to reduce contaminant levels in effluents • Discharge of treated effluent into surface water • Treatment of contaminated wells	• No further action		
03	Harvey-Knott, DE	1st Remedial Action	9/30/85	• Collect & treat surface water & dispose offsite • Removal and offsite disposal of sediments, sludges, bulk wastes, drums, and debris • Install ground water extraction and treatment system, treat ground water and apply to soils to flush out contaminants • Prepare site surface for flushing by: grading area, covering with 2' of clean soil, establishing vegetation	• Wetlands • Surface water		
03	Heleva Landfill, PA	1st Remedial Action	3/22/85	• Installation of an alternate water supply by extending an existing water main • Construction of a RCRA cap • Construction of surface water diversion and gas venting systems • Conduct a predesign study to fully delineate the source of contamination and determine sink-hole activity • Construction of an onsite treatment facility • Pump and treat ground water (source control) • Monitor and sample existing wells and surface water	• No further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Lackawanna Refuse Site, PA	1st Remedial Action	3/22/85	• Excavation and offsite disposal of drums and highly contaminated fill • Construct a leachate collection system • Installation of surface water drainage diversion • Clay capping and construction of gas venting systems • Reconstruction of access road • Development of monitoring program	• No further action		
03	Lansdowne Radiation, PA	1st Remedial Action	8/2/85	• Permanent relocation of residents	• Demolition and removal of a house		
03	Lehigh Electric, PA	1st Remedial Action	2/11/83	• Excavation and removal of contaminated soil, transformers and debris • Offsite disposal of soil • Demolition of onsite buildings • Backfilling, grading and vegetation of site to minimize erosion and control runoff	• No further action		
03	McAdoo, PA	IRM	6/5/84	• Clean and remove underground waste storage tanks • Excavation and offsite disposal of visibly contaminated soil • Evaluate analytical results of soil analyses	• Ground water		
03	McAdoo Associates, PA	2nd Remedial Action	6/28/85	• Removal and offsite disposal of the onsite tank, debris and contaminated soil • Limited excavation of soils • Construction of a RCRA cap • Diversion of surface water • Maintenance of surface water diversion ditches and cover • Conduct a comprehensive mining study to determine appropriate cap design • Evaluate the dilution factor during the design phase	• Ground water • Sediments		
03	Matthews Electroplating, VA	1st Remedial Action	6/2/83	• Provide municipal water service by extension of existing system	• No further action		

105

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Moyer Landfill, PA	1st Remedial Action	9/30/85	. Install soil cover . Erosion and sedimentation control measures . Surface water diversion . Leachate collection, treatment and discharge . Methane gas recovery and sale . Security/fencing measures . Ground water monitoring . Closure at conclusion of gas generation phase	. If PRP negotiations and/or the methane gas alternative fail, the following will be done: - Grade site, install rip-rap, flatten steep slopes - Gas venting and monitoring - Surface water collection and discharge to Skippack Creek - Leachate collection and treatment to meet 10^{-6} risk level in ground water - Ground and surface water monitoring, cap maintenance, leachate treatment		
03	Sand, Gravel & Stone, MD	1st Remedial Action (Phase I)	9/30/85	. Excavation and offsite disposal of hazardous materials . Ground water extraction and treatment with discharge to ponds, aquifer, or Mill Creek.	. Soil . Ground water		
03	Taylor Borough, PA	1st Remedial Action	6/28/85	. Removal and offsite disposal of drums and remnants . Collection and treatment of contaminated surface water . Excavation and offsite disposal of contaminated soils, wastes, and sediments from two of the former drum storage areas (Drum Storage Areas 1&2) . Backfilling and placement of a 24-inch soil cover over the remaining three former drum storage areas . Installation of a chain link fence around the perimeter of the soil covered areas	. Further study of contaminated ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Tyson's Dump, PA	1st Remedial Action	12/21/84	. Excavation and offsite disposal of contaminated soils and wastes . Upgrade the existing air-stripping facility to treat leachate, shallow ground water, and surface run-on . Excavation and offsite disposal of contaminated sediments within the tributary which receives effluent from the existing air-stripping facility	. Ground water . Offsite contamination		
03	Wade, PA	1st Remedial Action	8/30/84	. Removal and offsite disposal of contaminated soil, tires, tankers, waste piles and underground storage tanks . Demolish buildings, level debris, fill and grade property . Cover site with top soil and seed cap	. No further action		
04	American Cresote, FL	1st Remedial Action	9/30/85	. Excavation and consolidation of contaminated soils from areas both on and off the site in an onsite RCRA landfill	. Ground water		
04	Biscayne Aquifer Sites, FL	1st Remedial Action	9/16/85	. Add air-stripping to existing water treating system . Operate Miami Spring & Preston municipal wells	. Closure of NW 58th St. Landfill (to be addressed by EDD in FY86)		
04	Davie Landfill, FL	1st Remedial Action	9/30/85	. Dewater and stabilize sludge lagoon contents & place in single lined cell . Install cap on cell	. Ground water		
04	Miami Drum Services, FL	1st Remedial Action	9/13/82	. Excavation and offsite disposal of soil . Treatment of ground water encountered during excavation	. Ground water		
04	Varsol Spill Site, FL	1st Remedial Action	3/29/85	. No action	. Ground water		
04	Whitehouse Waste Oil Pits, FL	1st Remedial Action	5/30/85	. Construction of a slurry wall around the entire site . Treatment of contaminated ground water . Excavation and disposal of contaminated sediments under cap . Surface cap the entire site (RCRA 264)	. Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	A&F Materials-Greenup, IL	IRM	11/23/83	• Removal and offsite disposal of contaminated tank liquids and drum wastes • Temporarily cap lagoons • Conduct RI/FS	• Ground water • Soil		
05	A&F Materials Company, IL	EDD	6/14/85	• Removal and offsite disposal of all soils contaminated over the recommended action levels • Ground water monitoring • Cleaning and removal of onsite equipment and buildings • Testing of soil underlying the building, with disposal if contaminated above the recommended action levels • Site grading • Removal of the fence surrounding the site	• No further action		
05	Acme Solvents, IL	1st Remedial Action	9/27/85	• Provision for interim alternate water supply system by installation of home carbon treatment units • Excavation and offsite disposal of non-incinerable wastes; incineration of other waste materials and soils	• Ground water • Final remedial action to restore drinking water		
05	Berlin & Farro, MI	1st Remedial Action	2/29/84	• Excavation of contaminated landfill, drum and soil areas • Separate PCB and non-PCB wastes & dispose offsite • Incinerate liquid wastes and landfill solid wastes offsite • Backfill or cap site • Conduct RI/FS of soil and ground water contamination	• Ground water • Surface water • Soil		
05	Byron/Johnson Salvage, IL	1st Remedial Action	3/13/85	• Excavation and offsite disposal of all drums and highly contaminated soils • In-situ treatment of all soil with cyanide over 1 ppm	• Residual soils • Ground water		
05	Cemetery Dump, MI	1st Remedial Action	9/11/85	• Excavation and offsite disposal of 250 drums containing PCBs, oils, solvents and paint sludges at a RCRA Subtitle C facility	• Ground water • Soil		
05	Charlevoix, MI	IRM	6/12/84	• Provision for a permanent alternate water supply	• Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Charlevoix, MI	2nd Remedial Action	9/30/85	. Allow contaminant plumes to discharge to Lake Michigan under natural flow conditions . Continue long-term monitoring of plumes . Institutional controls on installation of private wells	. No further action		
05	Chem-Dyne, OH	EDD	7/5/85	. Installation of a ground water extraction system with subsequent treatment of the contaminated water . Demolition of onsite buildings . Removal of selected soil . Construction of a RCRA cap	. No further action		
05	Cross Brothers, IL	IRM	3/25/85	. Excavation and offsite disposal of surficial and buried waste materials and visibly contaminated soil	. Residual soils . Ground water		
05	Eau Claire, WI	IRM	6/10/85	. Construction of air-stripping facilities to remove VOCs from the contaminated ground water and discharge to municipal water treatment plant and distribution system	. Ground water . Source control		
05	Forest Waste, MI	IRM	2/29/84	. Fence construction	. Source control . Offsite contamination		
05	Kummer Landfill, MN	1st Remedial Action	6/12/85	. Provisions for an alternate water supply	. Source control . Ground water		
05	Laskin Poplar Oil, OH	1st Remedial Action	8/9/84	. Incineration of contaminated waste oil . Treatment of contaminated waste water	. Source control . Ground water		
05	LeHillier/Mankato, MN	1st Remedial Action	9/27/85	. Pump and treat ground water by air-stripping for a ten-year period or until acceptable levels are met . Extend LeHillier water supply system to affected areas . Abandonment of contaminated wells	. Source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Main Street, IN	1st Remedial Action	8/2/85	. Construction of air-stripping facilities to remove VOCs from the contaminated ground water, discharged into water treatment system and drinking water distribution system	. Complete RI/FS on ground water		
05	Morris Arsenic, MN	1st Remedial Action	8/7/85	. No action	. No further action		
05	New Brighton, MN (Interim Water Treatment)	IRM	6/24/83	. Interim treatment of municipal wells by granular activated carbon and air-stripping	. Ground water		
05	New Brighton, MN (Water Supply System)	IRM	9/19/83	. Extend existing public water supply system to affected private well users	. Ground water		
05	New Brighton, MN (Water Supply System)	IRM	8/2/84	. Extend existing public water supply system to replace contaminated municipal system	. Ground water		
05	New Lyme L/F, OH	1st Remedial Action	9/27/85	. Install cap over landfill . Install and operate extraction/containment wells to dewater landfill and eliminate leachate . Onsite treatment of ground water and leachate using biological disc, sodium hydroxide precipitation and granular activated carbon . Onsite consolidation of contaminated sediment . Gas control, fence, monitor ground water	. No further action		
05	Northernaire, MI	1st Remedial Action	9/11/85	. Excavation and offsite disposal of soils and sewer line to privately-owned RCRA Subtitle C facility . Clean building floor of dust and hazardous residue . Break-up 300 sq. ft. of floor and drywell, sample soil, excavate and dispose of any contaminated debris & soil at a RCRA Subtitle C facility . Backfill area with clean soil	. Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Old Mill, OH	1st Remedial Action	8/7/85	. Removal and offsite disposal of 95 percent of contaminants in soil . Ground water extraction and treatment using granular activated carbon . Impose aquifer use restrictions . Provisions for public water supply to those residences potentially affected by contaminated ground water	. No further action		
05	Outboard Marine Corp., IL	1st Remedial Action	5/15/84	. Excavation and offsite disposal of PCB contaminated materials . Construct onsite containment cell for moderately contaminated PCB material . Divert ground water around containment cell . Construct clay-lined dewatering lagoon . Treat supernatant and return to harbor . Cap	. No further action		
05	Reilly Tar, MN	1st Remedial Action	6/6/84	. Construction of a granular activated carbon water treatment system	. Ground water . Soil . Peat bog		
05	Schmalz Dump, WI	1st Remedial Action	8/13/85	. Excavation and offsite disposal of contaminated building debris	. Conduct RI/FS		
05	Verona Well Field, MI	IRM	5/1/84	. Provide new water capacity by drilling new wells . Implement barrier system . Treat purge water by air-stripping system . Treat air emissions by activated carbon adsorption system . Continue RI/FS	. Ground water		
05	Verona Well Field, MI	2nd Remedial Action	8/12/85	. Treat contaminated soils by enhanced volatilization . Contain ground water contaminant plume by pumping and treating at existing air-stripper	. Continue RI . Source control at other known sources		
05	Wauconda Sand & Gravel, IL	1st Remedial Action	9/30/85	. Install leachate collection drains . Provide for leachate disposal at Wauconda sewage treatment plant or at an offsite hazardous waste treatment facility	. Future RI/FS to address ground water, source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Wauconda Sand, IL (cont'd)			• Regrade settled, depressed and eroded areas with clean soil cover • Revegetate bare and eroded areas • Construct fence around site			
06	Bayou Bonfouca, LA	1st Remedial Action	8/15/85	• Offsite disposal of creosote waste	• Ground water • Bayou		
06	Bio-Ecology Systems, TX	1st Remedial Action	6/6/84	• Construction of onsite disposal cell with synthetic liner, leachate collection system, and final cover • Stabilize waste and place in onsite cell • Raise elevation of site above 100-year flood plain • Construct fence and warning signs • Install ground water monitoring system	• No further action		
06	Crystal Chemical,[2,3] TX	NDD	9/17/85				
06	Highlands Acid Pit, TX	1st Remedial Action	6/25/84	• Excavation and offsite disposal of waste material • Backfill and seed site • Construct fence and warning signs • Install ground water monitoring system	• ACL study ongoing to determine if any ground water action is required		
06	MOTCO, TX	1st Remedial Action	3/15/85	• Offsite biological treatment of contaminated pit water • Offsite incineration of organic liquids • Offsite disposal of sludges/tars and soils	• Ground water • Soil		
06	Old Inger, LA	1st Remedial Action	9/25/84	• Onsite land treatment of heavily contaminated soils and sludges • Onsite containment and capping of slightly contaminated soils • Close and seal ungrouted onsite well • Pump and treat shallow ground water aquifer • Treat and discharge offsite all contaminated fluids	• Ground water • Wood		

[2] - Enforcement Confidential
[3] - Remedy selection not finalized

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
06	South Valley, NM	IRM	3/22/85	• Installation of a new water supply well	• Source control • Ground water		
06	Tar Creek, OK	1st Remedial Action	6/6/84	• Diversion and diking at two major inflow areas • Plug 66 wells • Install ground water monitoring system	• No further action		
06	Triangle Chemical, TX	1st Remedial Action	6/11/85	• Incineration and deep well injection of the tank and drum contents • Decontamination of all onsite structures • Offsite disposal of trash and debris • Mechanical aeration of contaminated soils	• No further action		
07	Aidex, IA	IRM	8/24/83	• Offsite disposal of bulk liquids and semi-solids by deep well injection • Onsite drainage control	• Ground water • Soil		
07	Aidex, IA	2nd Remedial Action	9/30/84	• Excavation and offsite disposal of buried wastes and contaminated soil • Backfilling, grading and seeding of the site • Expansion of the monitoring well network and biannual ground water testing • Vacuuming and washing interior surfaces, floors and walls of the building onsite	• Ground water		
07	Ellisville, MO	1st Remedial Action	7/10/85	1) Callahan Property - Stabilize and control erosion of the fill area - Remove and dispose the plastic cover over the fill area and the cover's hold-down blocks - Remove and salvage the barbed-wire and chain link fences around the site - Remove the gravel in the two drum storage areas 2) Rosalie Property - Excavation and offsite disposal of contaminated soil, drums, cans, and other debris - Soil testing and analysis	• Callahan and Rosalie properties will receive no further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
07	Times Beach, MO (Interim Storage Facility)	1st Remedial Action	1/13/84	. Construct onsite interim storage facility . Transport highly contaminated soil from other sites for storage in facility . Restoration of other sites by excavation and temporary relocation of affected residents	. Permanent soil disposal		
08	Milltown, MT Supplemental ROD		4/14/84 8/7/85	. Abandon existing ground water supply . Replacement and relocation of water supply and transmission facilities . On-going sampling of residential water systems	. Sediments		
08	Woodbury Chemical, CO	1st Remedial Action	7/19/85	. Offsite disposal of pesticide contaminated soil . Offsite incineration of rubble	. No further action		
09	Celtor Chemical Works, CA	IRM	10/4/83	. Offsite transport and disposal of tailing piles and contaminated soil . Conduct RI/FS	. Soil . Ground water . Surface water		
09	Celtor Chemical, CA	2nd Remedial Action	9/30/85	. Excavation & offsite disposal of contaminated soils	. No further action		
09	Del Norte, CA	1st Remedial Action	9/30/85	. Excavation & removal of soil . Extraction & treatment of contaminated ground water . Disposal of spent carbon filters . Disposal of chromium-rich waste brine to RCRA facility . Disposal of treated ground water to POTW . Monitor ground water	. No further action		
09	Jibboom Junkyard, CA	1st Remedial Action	5/9/85	. Excavation and offsite disposal of contaminated soils	. No further action		
09	McColl Site, CA	1st Remedial Action	4/11/84	. Excavation and offsite disposal of wastes and soil	. No further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
09	Mountain View/ Globe, AZ	1st Remedial Action	6/2/83	. Permanent relocation of residents . Onsite burial of containerized mobile homes . Site closure by capping . Fencing and maintenance	. No further action		
09	San Gabriel/ Area I, CA	IRM	5/11/84	. Installation of packed tower air-stripping systems to treat contaminated ground water . Conduct RI/FS	. Ground water		
09	Stringfellow Acid Pits, CA	IRM	7/22/83	. Fence site, maintain cap, and offsite disposal of leachate	. Source control . Ground water . Soil		
09	Stringfellow Acid Pits, CA	2nd Remedial Action	7/17/84	. Extract and treat ground water and discharge to POTW	. Soil . Source control . Long term RI/FS		
09	Taputimu Farm/Insular Terratories, AS	1st Remedial Action	12/27/83	. Repack chemical/pesticide materials stored onsite . Decontaminate and seal onsite storage facilities . Transport all waste materials to mainland for offsite disposal	. No further action		
10	Ponders Corner, WA	IRM	6/1/84	. Construction of air-stripping towers at wells . Maintenance of system . Conduct RI/FS	. Ground water . Soil		
10	Ponders Corner, WA	2nd Remedial Action	9/30/85	. Continue operation of H1-H2 treatment system . Install variable-frequency controllers on well pump motors to reduce energy requirements . Change fan drives on treatment tower . Install new monitoring wells, upgrade existing wells, continue sampling & analysis of aquifer . Place administrative restrictions on installation and use of wells . Excavation and offsite disposal of septic tanks and drain field piping . Place administrative restrictions on excavation of soils	. Unspecified future remedial action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
10	South Tacoma Channel Well 12A, WA	IRM	3/18/83	. Pump and treat Well 12A . Air-stripping	. Ground water . Soil		
10	South Tacoma Channel Well 12A, WA	2nd Remedial Action	5/3/85	. Continue to operate IRM . Construction of a ground water treatment system where extraction, treatment and discharge of ground water will occur . Excavation and offsite disposal of contaminated soil . Soil flushing . Maintenance of institutional controls	. No further action		
10	Western Processing, WA	1st Remedial Action	8/5/84	. Onsite and perimeter monitoring of air quality . Removal and offsite disposal/incineration of all bulk liquids, drummed liquids, waste piles and other debris . Removal and proper disposal of all transformers and substation equipment . Demolition and offsite disposal of all onsite buildings . Dismantling of all onsite bulk storage tanks . Control and treat stormwater	. Ground water . Soil		
10	Western Processing, WA	2nd Remedial Action	9/25/85	. Soil sampling and analysis of on and offsite areas . Excavation & offsite disposal of selected soils and non-soil materials, excavate or clean & plug all utility and process lines in Area I . Construct and operate ground water extraction and treatment system . Construct, operate and maintain a stormwater control system . Perform supplemental remedial planning studies if ground water contamination migrates	. Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
10	Western Processing, WA (cont'd)			• Excavation and onsite disposal of selected soils; excavation of of utility lines; clean utility manholes and vaults • Install and maintain cap • Perform bench scale tests of soil solidification technique • Excavate Mill Creek sediments			